FRITZ J. FRANK
President

J. H. VAN DEVENTER
Editor

C. E. WRIGHT, *Managing Editor* — J. A. ROWAN, *News Editor* — A. I. FINDLEY, *Editor Emeritus*

R. E. MILLER, *Machinery Editor* — F. J. WINTERS, *Art Editor* — T. W. LIPPERT, *Metallurgical Editor*

Associate Editors

F. J. OLIVER — W. A. PHAIR — G. RICCIARDI

F. JURASCHEK
Consulting Editor

Washington Editor
L. W. MOFFETT

Resident District Editors

T. C. CAMPBELL, *Pittsburgh* — ROBERT G. BINGHAM, *Chicago*

D. R. JAMES, *Cleveland* — W. F. SHERMAN, *Detroit*

Editorial Correspondents

F. B. RICE-OXLEY, *London, England* — ROBERT G. McINTOSH, *Cincinnati*

G. FRAZAR, *Boston* — P. FIDRMUC, *Hamburg, Germany*

L. E. MEYER, *Milwaukee* — CHARLES POST, *San Francisco*

F. SANDERSON, *Toronto, Ontario* — ASA ROUNTREE, JR., *Birmingham*

LEROY W. ALLISON, *Newark, N. J.* — ROY M. EDMONDS, *St. Louis*

F. T. TURNER, *Buffalo*

★

Owned and Published by

CHILTON COMPANY
(Incorporated)

Publication Office
Chestnut and 56th Sts.,
Philadelphia, Pa.

Editorial and Executive Offices
239 West 39th St.
New York, N. Y.

OFFICERS AND DIRECTORS

C. A. MUSSELMAN, *President*
FRITZ J. FRANK, Executive Vice-President
FREDERIC C. STEVENS, Vice-President
JOSEPH S. HILDRETH, "
GEORGE H. GRIFFITHS, "
EVERIT B. TERHUNE, "
WILLIAM A. BARBER, Treasurer
JOHN BLAIR MOFFETT, Secretary
JOHN H. VAN DEVENTER
JULIAN CHASE
THOMAS L. KANE
CHARLES S. BAUR
G. CARROLL BUZBY
P. M. FAHRENDORF

★

C. S. BAUR, *General Advertising Manager*
A. H. DIX, *Manager Reader Service*

Member, Audit Bureau of Circulations
Member, Associated Business Papers
Indexed in the Industrial Arts Index.
Published every Thursday. Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 a year. Single copy, 25 cents. Cable Address, "Ironage, N. Y."

ADVERTISING STAFF

Emerson Findley, 621 Union Bldg., Cleveland
B. L. Herman, Chilton Bldg., Chestnut & 56th Sts., Philadelphia, Pa.
H. K. Hottenstein, 802 Otis Bldg., Chicago
H. E. Leonard, 239 W. 39th St., New York
Peirce Lewis, 7310 Woodward Ave., Detroit
C. H. Ober, 239 W. 39th St., New York
W. B. Robinson, 428 Park Bldg., Pittsburgh
D. C. Warren, P. O. Box 81, Hartford, Conn.

THE IRON AGE

Contents

MAY 26, 1938

Circumstantial Evidence 33
Galvanizing Problems from Metallurgist's Viewpoint 34
Coupling Sales to Research 37
Bethlehem Operates New Rod Mill 40
Iron Quality as a Problem of the Steel Industry 42
New Devices for Plant Service 46
Annealing Fine Wire in Britain 50
Foundrymen's Convention 52
Automotive Industry 56
Washington News 60
THE NEWS IN BRIEF 68
Plant Expansion and Equipment Buying 105

▼ ▼ ▼

Products Advertised 121
Just Between Us Two 123
Index to Advertisers 146

Copyright 1938 by Chilton Company (Inc.)

RYERSON *Certified* STEELS

Great Aid to Steel Treater

Never before could you be sure how different bars of a standard specification alloy steel drawn from warehouse stock would react to heat treatment. Now with Ryerson Certified Alloys you not only get selected, uniform analysis steels, but also COMPLETE INFORMATION TO GUIDE YOUR HEAT TREATER. With every order, Ryerson sends a data sheet that shows the chemical, physical and hardening characteristics of the particular bars furnished.

The greater uniformity of these steels and the accurate heat treating data furnished, eliminates much costly testing, helps reduce rejections and makes it easier to secure desired results—all at no extra cost to you.

Let us give you the complete story of Ryerson Certified Steels including Tool Steels, Stainless, Cold Finished and all Carbon Steel Products. Write for booklet J3.

JOSEPH T. RYERSON & SON, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

Ryerson Certified Steels in Stock for Immediate Shipment

HOT ROLLED ALLOYS

S.A.E. 2315, 2320, 2330, 2335, 2340, 2345, 2350, 3115, 3120, 3130, 3135, 3140, 3250, 4140, 4615, 6145, 52100; Rycase, Rytense A. A.

COLD DRAWN ALLOYS

S.A.E. 2315, 2320, 2330, 3115, 3120, 3135, 3140.

HEAT TREATED ALLOYS

Ryco (hot rolled); Rycrome (Hot rolled and cold drawn); Nikrome "M" (hot rolled); Ry-Ax and Ry-Arm (hot rolled).

STAINLESS STEELS

Allegheny Stainless Sheets, Plates, Rounds, Squares, Hexagons, Flats, Angles, Pipe, Tubing, Bolts, Nuts, etc., in a variety of finishes.

COLD FINISHED STEELS

Standard Shafting; turned ground and polished; Special Accuracy Stock; Rycase High Manganese Screw Stock; S.A.E. 1020, 1035, 1112, 1120, etc.

TOOL STEELS

Ryerson B. F. D. Die Steel; "Shock" Steel; V. D. Steel; High Speed Tool Steel, etc.

GENERAL STEEL PRODUCTS

Beams; Channels; Angles; Tees; Zees; Plates; Sheets; Spring Steel; Boiler Tubes and Fittings; Bolts; Nuts; Rivets; Nails, etc.

Write for the Ryerson Stock List.

RYERSON STEEL-SERVICE

▲▲▲ THE IRON AGE ▲▲▲

MAY 26, 1938

ESTABLISHED 1855 Vol. 141, No. 21

Circumstantial Evidence

OLD Abe Zed, sheepherder of 50 years ago, had a dog with poor judgment. The dog was foolish enough to argue with a grizzly and had his head bitten off as a result.

Abe searched for the missing dog and when he finally found its remains, he noticed a giant jack rabbit leaving the scene of the crime. The rabbit had merely been investigating the strange sight of a headless dog, but Abe jumped to the conclusion that the rabbit had committed the murder.

It was almost worth the loss of the dog to have such an exciting story to tell and Abe told it with plenty of trimmings. It was repeated so much that the legend grew of a fabulous breed of giant rabbits that went about killing sheep dogs. Whenever a dog died from natural or unnatural causes, the legend received another boost. So finally the sheepherders' association petitioned the legislators to do something about preventing the total extermination of sheep dogs.

In those days, however, legislators liked to obtain facts before they legislated. So they took a survey of the relative trends of the growth of giant rabbit and sheep dog population and found that the rate of increase of the latter was even greater than that of the former. That, of course, smashed the theory that the rabbits were exterminating the dogs.

A study of the rate of growth of mechanization and its relation to the employment of human labor would, I believe, equally disprove the circumstantial evidence of technological displacement.

Let me give you one specific example from the files of a company that has kept a ten-year record of machine employment and man-hour employment. This company is the Titan Metal Mfg. Co., of Bellefonte, Pa.

The record begins in 1928, at which time the company had a total of 459 machines and an employment man-hour index of 130. Year by year the record shows the addition of machines, but a still more rapidly increasing rate of man-hour employment, until in 1937 with 734 machines the employment index was 483. In other words, with a 60 per cent increase in the number of machines, the hourly employment increased 270 per cent and salaried employment 170 per cent.

These facts are known to the employees of the Titan company, and thus when a depression requires a lay-off, you do not find them attributing it to competition with the machine. They know that machines have worked for and not against them.

J. H. Van Deventer

Galvanizing Problems from the Metallurgist's Viewpoint

o o o

By W. M. PEIRCE

Chief, Research Division, New Jersey Zinc Co.

o o o

A GREAT deal of education has taken place in the field of zinc coatings in the past 15 years. Education of the consumer, education of the producer, and education of the zinc industry which, of course, has a vital interest in the subject.

The education of the consumer has been of a very elementary sort and many consumers still lack this elementary education. In so far as it has progressed, it has taught the consumer that galvanized iron is steel with a coating of metallic zinc applied to it for corrosion protection and that the life of this protection depends almost entirely on the thickness of the zinc coating. It has taught the consumer that the mere absence of visible flaking when a zinc coated sheet is bent, desirable as that may be in itself, is no guarantee of a good life from that sheet. The logical outcome of this knowledge is the beginning of a demand, which is certain to grow, for coatings which are both heavy and adherent.

The producer has been faced more acutely with the fact that light coatings of short life open the door to competition from non-metallic materials and that it is difficult to exercise any control over the proper restriction of light, adherent coatings to those few fields for which they may be adequate. The problem, therefore, becomes one of increasing the weight of coating without losing adherence and without a prohibitive increase in cost.

The zinc producer has learned that, however strong the case for heavy coatings may appear on paper, the education of the consumer to the payment of a premium for a better product is painfully slow and progress must depend in great measure upon learning to apply easily heavy coatings of good adherence which can be sold on a competitive market.

This problem has been approached by electrolytic methods which have attracted a great deal of attention in recent years. Important results have been achieved and further progress in this field can undoubtedly be expected. For example, in the methods where the zinc is derived from zinc anodes much remains to be learned about anode corrosion. In the New Jersey Zinc Co. laboratory, nearly a year has been spent on this problem and only recently has there been a beginning of an understanding of some of the fundamental factors involved. However, the author is not competent to discuss electrolytic methods, and this brief discourse will be limited to the hot dip process. Neither will any effort be made to discuss the spray methods which are becoming of so much interest in the fields where the other methods are not applicable.

The problems of hot galvanizing are neither exclusively problems in steel metallurgy nor in zinc metallurgy but a combination of the two. Because the product is primarily steel, because it must be manufactured in a steel plant and marketed as steel, the development work necessary to a solution of the problems will be and is being done in steel plants and laboratories. There are elements of the problem, however, on which it should be possible to derive useful information from the field of zinc metallurgy.

The adherence of a zinc coating on steel has been quite clearly demonstrated to be influenced, first, by the character of the iron-zinc alloy layer or layers which form during hot dip galvanizing, and, second, by the ductility or toughness of the outer layer of zinc. It must be borne in mind that the structure of this zinc layer is essentially a cast structure and has none of the ductility conferred by mechanical working of the structure.

Surface Condition Important

The character of the alloy layer is dependent most of all on the composi-

o o o

THE ammonium chloride flux in this plate galvanizing bath performs best when traces of lead and cadmium are present, but these elements do the zinc structure no good. The use of aluminum in the zinc bath, once a proper technique is evolved, will undoubtedly result in far better coatings.

o o o

tion of the steel base and the physical condition of the steel surface; that is, whether the surface is rough or smooth, or whether there is a coating of sponge iron remaining upon it from the pickling operation. On steel of any composition, the alloy layer may be reduced to a comparatively thin and dense appearing band if the steel surface is clean and smooth when it enters the zinc bath. This may be brought about, for example, by galvanizing promptly after rolling so that only a minimum of pickling is required, and then accompanying this practice with an effective washing of the steel to remove any iron salts or sponge iron. This washing becomes simple if the pickling time is very short. Not only is less alloy formed but the boundary between the alloy layer and the zinc coating approaches a straight line instead of being very irregular with jagged points of alloy notching the underside of the zinc coating and affording starting points for cracks when the coating is bent.

A second factor is the time of immersion in the galvanizing bath. Temperature is only a minor factor. The time of immersion can be made extremely short if the iron salts from the pickling are removed by washing and the steel fluxed with 25 per cent zinc chloride instead of the common hydrochloric acid flux before it enters the zinc bath. This eliminates the necessity for converting the iron chloride to metallic iron which forms dross and zinc chloride, the latter then acting as a flux—all of this absorbing heat and taking time, to say nothing of producing unnecessary dross. This is the rather simple theory back of the known fact that adherence of zinc coatings can be greatly improved by galvanizing a freshly rolled or drawn steel surface with a minimum of pickling, thorough washing, zinc chloride flux, and a minimum time of immersion in the galvanizing bath.

Coming to the effect of the composition of the zinc it may be stated, first, that with one or two exceptions, which will be discussed later, the zinc has little, if any, influence on the thickness or character of the alloy layer. It does, however, have a very great influence on the ductility and toughness of the zinc layer which has been previously mentioned as the second factor determining the adherence of a zinc coating. Briefly, cadmium, which is virtually absent in high purity zinc, has a very strong embrittling effect on a cast zinc structure and is present in sufficient quantity in other grades of zinc to greatly increase the tendency of the zinc layer to crack when bent. This is the reason for the extensive use of high purity zinc in galvanizing wire which must have heavy adherent coating. On the other hand, there are elements which, when added to pure zinc, increase the ductility of the cast structure either by going into solid solution or through grain refinement. A way to take advantage of such alloying elements may some day be found.

Aluminum Beneficial

This brings up an important problem which in itself has prevented any extensive use of high purity zinc for sheet galvanizing and is apt to be a serious problem in the use of any alloy of zinc. This is the difficulty of maintaining satisfactory entrance and exit fluxes on a sheet galvanizing bath. It is a peculiar circumstance that the zinc ammonium chloride base fluxes, which are exclusively used in galvanizing and for which no substitute seems to have been found in spite of a considerable amount of research on the problem, perform without difficulty only when some lead and cadmium are present in the zinc and so introduce traces of lead and cadmium chlorides into the flux. Incidentally, if the lead and cadmium chlorides are introduced directly into the flux they are partly reduced to metal which enters the galvanizing bath until an equilibrium is reached between the metallic content of the bath and the chloride content of the flux.

It is this same fluxing problem that has prevented the use of aluminum in sheet galvanizing baths. Aluminum is the principal exception to the earlier statement that the composition of the zinc does not affect the alloy layer. In amounts from approximately 0.2 per cent upward, aluminum in the zinc bath exerts a profound effect on the alloy layer formation, nearly or completely eliminating the alloy layer present and perhaps changing the chemical character and physical properties of whatever alloy is formed. The adherence can be greatly improved by such an aluminum addition if other factors are correctly controlled. Various proposals have been made for getting around fluxing difficulties attendant upon the use of high purity zinc in sheet galvanizing and the use of aluminum. It does not seem unreasonable to suppose that an answer may be found to this problem and that an important advance in the production of adherent coatings heavier than

the present common commercial grades may thereby result.

Aluminum Valuable

If a means of eliminating the fluxing difficulties is ultimately found, this may well open up the field for experiment with alloyed zinc coatings which might have better bending properties or moderately improved resistance to corrosion. It is in this field that the experience of the zinc metallurgist should be of greatest value since much is known about the effect of small alloy additions of other metals to zinc in relationship to corrosion resistance and physical properties. For example, it is known that certain combinations of elements are desirable while other combinations of elements in zinc are incompatible. An excellent example of this is afforded in the die casting field where a few per cent of aluminum in a zinc alloy may greatly improve its properties if present in combination with the proper elements and may produce a worthless alloy in combination with other elements. In other words, zinc alloys, like the alloys of other metals, must be intelligently formulated to be useful.

Having touched briefly upon the matter of chemical properties, the problem of stagnant water corrosion of galvanized material may properly be discussed. As you all know, zinc exposed to the weather in the ordinary way forms a film of hydroxide which, absorbing oxygen and CO_2 from the atmosphere, is converted to oxide and carbonate which retards further corrosion. When, however, conditions prevent the access of oxygen and CO_2, the corrosion proceeds rapidly and a voluminous white zinc hydroxide product is formed. This type of corrosion can destroy even a heavy galvanized coating in a comparatively short time. A common condition which can afford an opportunity for this to occur is when galvanized sheets are piled flat in the open and rain is drawn between the sheets by capillarity, affording the water for hydroxide formation but excluding a proper supply of oxygen and CO_2. Tightly bundled sheets or wire subjected to changes of temperature during storage may condense sufficient moisture to bring about the same condition. Since it is practically impossible to avoid at least the occasional occurrence of such conditions, some means of rendering the zinc coating immune to this type of attack is obviously desirable and a very effective and inexpensive means of doing this has been developed in the process to which the New Jersey Zinc Co. has given the trade name "Cronak."

The "Cronak" treatment consists of removal of oil or grease if necessary, a cleaning in a simple dilute hydrochloric acid dip (this is a recently developed improvement in the method) and a dip of a few seconds, usually about ten, in a solution containing a dichromate. This is followed by rinsing and rapid drying at a low temperature. This is ordinarily best accomplished by the use of squeegee rolls followed by an air blast. The rapid low temperature drying is necessary to produce an adherent coating which will stand fabricating operations. A bronze colored film is produced which in a good many tests over a period of years has been shown to prevent completely the formation of white corrosion products and to provide a useful degree of added protection under a variety of conditions of exposure. The process lends itself to continuous application immediately after galvanizing. The solution maintenance is very low and all of the steps simple and inexpensive.

Immediate Painting Best

There are an important number of cases where steel is used and where conditions are so corrosive that the protection afforded even by heavy galvanizing is not all that is desired. Frequently in such cases a question arises as to whether the galvanizing should be immediately painted or whether painting should be done after the zinc coating is partly weathered away. There is danger of allowing the corrosion of the zinc coating to proceed too far before painting and it is becoming more common to avoid this danger by painting the galvanized steel at the outset. Also in cases where the object of painting is for decoration, the painting is, of course, desirable immediately. The satisfactory painting of zinc surfaces has presented a considerable problem, a solution for which has been approached in many ways. Special types of galvanizing and chemical treatments of the zinc surface have their respective and important merits which will not be discussed herein. But whether such treatments are used or whether it is necessary to paint ordinary galvanized iron without any chemical treatment, it appears to be rather definitely established that a zinc dust paint is a very satisfactory solution to the problem of an adherent priming coat for zinc surfaces. In many cases, it may also be a suitable finishing coat, though the limitation of color or the desire for the most acid-resistant finish coat often gives the preference to some other paint as a finish coat over the zinc dust primer. A primer formula that has proven particularly satisfactory is 80 per cent zinc dust and 20 per cent zinc oxide. By the use of non-gassing zinc dust and a non-acid vehicle, zinc dust paints are produced which package very satisfactorily and give no trouble from gassing or settling. A very large number of paint manufacturers are supplying such zinc dust priming paints at the present time. These paints can be tinted to reds, browns, and greens with satisfactory results.

Although it is somewhat apart from the subject of galvanizing, it may not be amiss to point out that a paint of the type just mentioned modified by the addition of iron oxide is coming to be recognized as a very desirable priming paint for black iron and steel and is an excellent shop coat paint. Fifteen to 30 per cent of iron oxide may be satisfactorily substituted for an equivalent percentage of zinc dust.

To conclude, nothing has yet appeared to change the fact that metallic zinc is the best and most economical rust protection for steel for the great majority of uses. Hot dip galvanizing still seems to be the most adaptable method of applying a zinc coating and while this method has its problems, the possibilities of improving the product and of maintaining a low operating cost appear from the zinc metallurgist's viewpoint to be by no means exhausted. On the contrary, it would be surprising if in this age of technological advance, material progress were not forthcoming in so important a field.

Ferro-Mincerite to be Made in Seattle

WASHINGTON Nickel Mining & Alloys, Inc., American Bank Building, Seattle, Wash., is building a smelting plant at Seattle to handle hematite iron, nickel, chrome and manganese ore. The first pilot electric furnace unit will soon go into production, making a pig iron, to be called ferromincerite, which will have an approximate analysis as follows: 2.78 per cent carbon, 0.15 silicon, 0.008 manganese, 0.013 phosphorus, 2.24 chromium, 2.25 nickel, 0.05 cobalt, a trace of aluminum, and 0.057 per cent sulphur.

Coupling Sales to Research*

By R. E. ZIMMERMAN

Vice-President, United States Steel Corp. of Delaware

NOT so many years ago the convenient adage, "oil and water never mix," enjoyed the status of a proverb. There was visual evidence of the mutual aloofness of oil and water. The casual observer could readily see the line of demarcation between the two substances whenever they were brought together, and in the case of anything so apparent there was little reason to question the general soundness of the evidence. More recently, however, the proverb has lost much of its validity, as any one can testify who has observed the modern cutting compounds at work, or has enjoyed the smooth consistency of a mayonnaise dressing. Under properly regulated conditions, oil and water can be made to mix most readily and intimately, and thereby perform many new and valuable services for mankind.

It is hardly proper to refer to sales and research in terms of oil and water. There is, however, some similarity in the behavior of the two couples, which is of significance to both sales personnel and to those who are engaged in research. That sales and research did not mix to any large extent throughout centuries of business history is a fact well known to almost every student of industrial methods. That they are now frequently joining hands or mixing more intimately to accomplish new and desirable purposes in American commercial enterprise is likewise quite readily apparent. Each did remarkably well by itself for many years; together they are doing much better.

Salesmanship is an ancient and honorable art, having been practiced since time immemorial by all civilized peoples. Wherever and whenever goods were to be exchanged or sold, salesmen were on hand to apply their efforts. We are not concerned in this discussion primarily with tracing by successive stages the development of sales technique or functions from the relatively simple transactions of the early years to the highly organized methods required by modern business, but rather with pointing out how research can be and now is properly "coupled" with sales.

The methods employed by the Indians in selling Manhattan Island to the early Dutch settlers at a very low delivered price, and without much competition, have little in common with those invoked in marketing the output of a modern steel concern. It is safe to say, however, that the Indians needed little or no assistance from research to consummate their deal, whereas in 1938 a little help on hardenability or grain size might readily be a determining factor in winning the confidence and patronage of an important customer.

In the days when the operations of all industry were relatively simple and the demands of the trade were equal to or exceeded the productive capacity of the country, the necessity for a close affiliation between research and sales was not readily apparent, as selling wore an aspect quite different from the one it presents today. Within the memory of many present-day executives, however, not only have new methods been developed to meet modern marketing conditions, but new scientific elements have been injected into the makeup of business to influence its diversified activities in numerous ways. An important one of these elements is research.

Organized industrial research, as we now have it, is relatively young. Certainly there was comparatively little of it to be found in American industry before the beginning of the twentieth century, notwithstanding the evidence that problems had been studied, inventions made, and processes developed, at a relatively mild pace over a long period of years. But research itself is not young, if by research we mean a systematic and determined effort to find out and understand all of the unknown factors of any phenomenon. For centuries men in universities and private laboratories had been exploring the physical world, deducing the laws of nature, measuring forces, and patiently building up

* Paper read before the general meeting of the American Iron and Steel Institute, New York, May 26.

the world's store of scientific knowledge.

Business men were willing to furnish some of the funds with which this work was prosecuted, but rarely thought of inviting more than a few research workers or eminent engineers into their plants. Science and industry thus pursued, in the main, their separate and independent paths for years on end, without much more than a nodding acquaintance. Research was looked upon as a worthy but mysterious activity, perhaps a little nebulous and somewhat related to magic, but certainly not a compatible ingredient in the practical affairs of business.

It must be said, however, in justification of the early attitude of the industrialists, that the language used by the scientists was not always conducive to the ready formation of an intimate friendship — his differential equations did not seem to offer immediately either an improved product or an enlarged market.

During this period of comparative isolation, however, the scientist had developed, along with masses of well-arranged data on various subjects, a most important tool for subsequent use in industry, namely, the method of scientific approach to the study and solution of problems.

Becoming Acquainted

The mutual aloofness of industry and science was dissolved by the operation of a number of factors whose influence, following a gradual build-up, began to increase in effectiveness less than 50 years ago.

America was growing apace. Industry was striving to meet the demands of a rapidly developing country and was finding difficulty in training a sufficiently large number of men, by the methods then in vogue, to meet its mounting internal requirements.

Valuable service had been rendered heretofore by consulting engineers and experts; indeed their services helped pave the way for the later employment of similar talent directly attached to each organization. Certain far-sighted educators, taking note of the growing complexity and expansion of business, began training at first engineers and chemists, and shortly thereafter other technologists, expressly for industrial work.

The infusion of these men into the daily routine of mine and plant seemed to bring tangible benefits, so that the way was prepared for the employment of more and more technologists. Scientists became aware of the fact that they had something to contribute to industry, and industrialists in turn recognized that a grounding in the sciences furnished a desirable foundation upon which to build the subsequent training of an employee. Persuaded by the results they had seen, and spurred by the preaching of those who already had visualized far reaching possibilities in a union of

R. E. ZIMMERMAN

As vice-president in charge of research of the United States Steel Corp. of Delaware, Mr. Zimmerman has long been in a position to study the relationship between present-day research and selling technique.

science and industry, it was not long before industrialists were willing to employ and set aside groups of specially trained men to study and solve specific problems.

During this period of growing intimacy between science and industry, inventions were appearing in increasing numbers, pointing to new products and new industries, imposing strange problems and specifications on potential suppliers of materials, and generally stimulating the development of new methods of manufacture.

To paint a rapid word picture of the situation, need any one more than mention, to the initiated, a few examples? Improved railroad equipment, from roadbed to rolling stock, the automobile with its manifold requirements, apparatus for the production and refining of petroleum, electrical equipment in almost endless variety, new processes for canning, and specialized agricultural implements—all these serve to call attention to what was developing in the fields of various industries which in turn would require technical assistance all the way from raw materials to sales service.

Long before the modern variety of organized industrial research was known, Francis Bacon, keen observer and philosopher of the seventeenth century, whose experience with technical developments was far less than ours, contributed the following pertinent remarks on the subject:

"If many useful discoveries have been made by accident or upon occasion, when men were not seeking for them but were busy about other things; no one can doubt but that when they apply themselves to seek and make this their business, and that, too, by method and in order—and not by desultory impulses—they will discover far more."

Now discovery is not the principal theme of this paper, nor is any one branch of research its sole concern, as related to sales, because every factor which affects the products of a company is of significance to its sales department. For purposes of subsequent discussion, it makes little difference whether we couple sales with research or research with sales, as long as the two are brought together and made to collaborate in the interest of improving business. Any attempt to assign a preference in position would be about as fruitful as the long standing argument about the priority of the egg and the chicken.

Economic and Market Research

Research, in a broad sense, is not confined to efforts exerted in laboratories. If we adhere to the idea that it is an attempt, by the application of scientific methods, to fathom all of the unknown factors of any situation, then economic research is the first research activity to be coupled directly with sales. One must know not only that he has a good product to sell, but also whether conditions are such that an attractive market may be built up for it, in the face of world competition and the ability of customers to buy.

Economic research deals with such broad considerations. For example, does it make any difference to your company whether the labor cost in producing a ton of reinforcing bars in Japan is, say one-third that in the

United States, or whether Belgium must find foreign markets for by far the larger part of her production of steel? Does a change in freight rates influence the outlook for your markets in Florida, Michigan or Idaho? In what direction are the preferences of the consuming trade tending?

At what prices can competitive products, produced outside your industry, be marketed, and will the development of cheaper power be of greater advantage to them or to steel? To what extent do you care about bank clearances, or the index of commodity prices, or the possibility that large numbers of wage earners and farmers may be in position to build or purchase new homes? What are the chances of determining, for this year and next, the direction of the curve which gives the per capita consumption of steel in the United States?

Those are only a few samples of the economic considerations a sales executive wishes to explore for the purpose of painting a picture of the broad trends which affect the activities of his organization. The numerical data accruing from economic research, it is true, may not be as precise as those from engineering or metallurgical research, but they are certainly not to be disregarded in the orientation of long-range sales effort.

On the same line with economic research, we now couple with sales what is commonly known as market research. The latter may be an essence distilled from the former, nevertheless it is of sufficient importance to warrant mention in separate paragraphs.

A market survey, if carefully planned and executed, can tell a salesman where to go and his company what to do in the near future. There is no suggestion of humor in the foregoing sentence. A knowledge of the size and location of markets for various commodities is an essential ingredient in any enlightened plan for the production and distribution of steel products. Each industry, in fact, develops information appropriate to its own line of activity and evaluates both the normalities and eccentricities in the demand, otherwise it is at a distinct disadvantage.

Figures on past requirements, current rates of consumption, and estimated future possibilities are included in the make-up of a comprehensive market survey for any district. The first two items just mentioned are basic and indispensable as groundwork, the third, which is really desired, is naturally the most difficult to estimate.

Research and Technology

A steel producer engaging in market research wishes to know not only what is the total consumption of steel in a given territory but what it is apt to be some years hence; also he would like to learn of any factors operating to bring about a substantial change from present conditions. With the exercise of skill and diligence, a trained investigator can develop estimates useful for the survey, even though he may not be expected to project, solely on the basis of his own resources, another bridge across San Francisco Bay or the institution of an armament program.

A sales department thus equipped and fortified with the information which accrues from economic and market research, and further assisted by the activities of a promotional division engaged in studying new adaptations of its products, is in a rather favorable position to decide how best to apportion and direct its efforts. Is there a further advantage to be gained by maintaining a close liaison between sales, with its own particular brand of research, and a department of research and technology which is concerned with scientific and technical matters pertaining to processes and products?

This question need not be answered by arguments in the abstract, there is evidence to be adduced. It must be borne in mind, however, that in whatever may be said on this phase of the subject, there is no disposition to claim for research alone more than a share of the credit for the results which have been accomplished. Product research is just one of a number of important factors which have a bearing on each case, and product research, without sales collaboration, could easily be excellent but futile. That the two working together can accomplish wonders is readily attested.

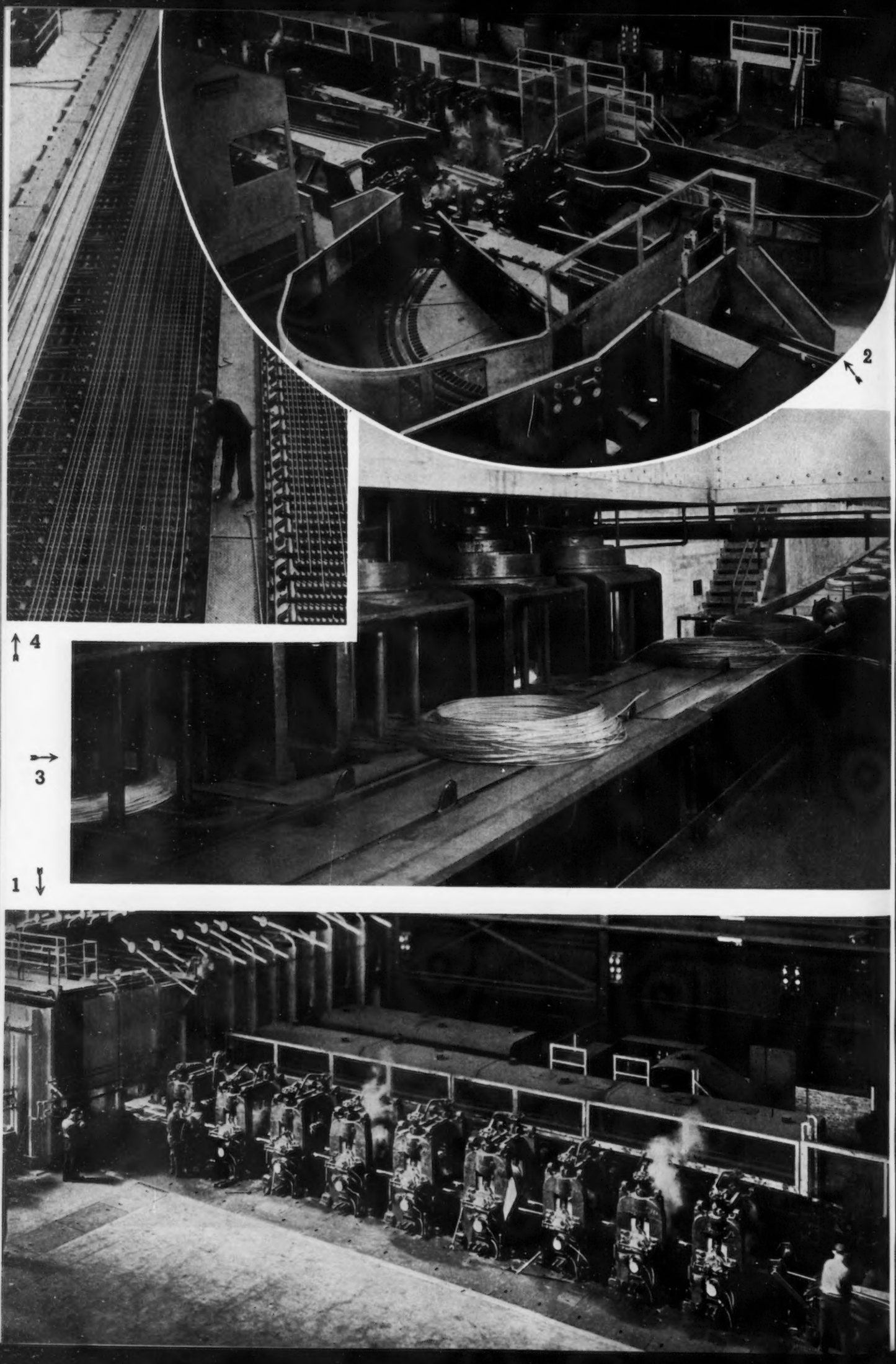
o o o

Ed. Note — The second and last section of this article, which will appear next week, will conclude the discussion of research and technology, and will consider in detail the inter-dependence of research and sales.

o o o

IN the use of metal-clad factory assembled switchgear, the steel industry is credited with setting the pace. The accompanying illustration, by courtesy of the Westinghouse Electric & Mfg. Co., is an example of one of the modern large metal-clad structures, in this case for the control and metering of 6600-volt circuits of flush mounted instruments.

o o o


2
4
3
1

Bethlehem Operates New Rod Mill

By CARL E. JOHNSON
Superintendent Rod and Wire Mill, Maryland Plant, Bethlehem Steel Co.

THE starting of a new continuous combination rod and merchant mill at the Maryland plant of Bethlehem Steel Co. marks an important step in the $35,000,000 expansion program which has been in progress at that mill for the last two years.

High quality production is insured in this modern mill, where a No. 5 rod, nearly a mile long, is delivered to the reels in about 60 sec., emerging from the last stand at a speed of about 4000 ft. per min., or nearly 46 miles per hr. Close tolerances, accuracy of contour, and improved physical properties are directly attributable to this high speed operation, and to the Morgoil roll bearings mounted on tapered necks on all the stands.

Together with the older 17 stand continuous No. 1 rod mill the new, or No. 2 mill, will supply rods from No. 5 up to ¾ in. in diameter to the local wire mills. The new mill is also equipped to roll concrete reinforcing bars, in sizes from ⅜ in. round up to and including 1 in. square, and also will turn out accurate merchant rounds and squares.

The first 15 stands of the mill are designed for the simultaneous rolling of four strands of rod. At the present time, however, only one two-strand finishing train has been installed. The addition of a second train, with coiling and conveying equipment, is the only requirement for four-strand production, at which time an output of over 20,000 tons of rod per month will be possible. The present two-strand capacity is about 12,000 tons per month.

Billets are received in standard lengths of 30 ft., and of the following cross sections: 1 13/16 in., 2 in., 2¼ in., 2½ in., and 3 in. square, varying from 335 to 918 lb. in weight.

As a billet is fed into the upper end of the heating furnace the entire row of billets is pushed down the inclined furnace bed, toward the hot end. The furnace, which is of the suspended arch type, has an effective hearth area of 30x50 ft. and an hourly heating capacity of 50 tons of billets, which is more than sufficient for full four-strand operation. The billets are heated slowly and uniformly until they finally reach the proper rolling temperature. Then, one by one, they are pushed out of the furnace, at the lower end, into the "bite" of the rolls of the first of the nine roughing stands (photo 1).

The rod mill has 21 stands, numbered from 0 to 20, and divided into nine roughing stands (Nos. 0-8), four intermediate roughers (Nos. 9-12), two looping stands (Nos. 13 and 14, as in photo 2), and six finishing stands (Nos. 15-20). Because of the special provisions for accurate vertical, horizontal, and longitudinal adjustment of the rolls, and because the Morgoil oil-film bearing does not wear, very accurate alinement of the passes can be maintained and a high precision in the product obtained.

Maximum reduction in any pass does not exceed 35 per cent, while the minimum is 9 per cent, in the last pass. Rolling speeds vary from about 6 r.p.m. in the first roughing stand to 1500 r.p.m. at the last pair of rolls. A billet passes through all stands in about 60 sec. The temperature drop during rolling is low, not more than about 300 deg., which insures close tolerance and uniform physical properties in the rod.

From the finishing train the rod is delivered to four reels by specially designed, water cooled connecting pipes. A descaling device removes part of the scale at this point, while a system of spray nozzles controls the temperature of the rod prior to coiling. Water eliminators following the spray nozzles remove surplus water from the rod before it reaches the reels. The reels are of the laying type (see photo 3).

The rod finishing mill is used for rods in sizes up to ⅜ in. diameter. Rods of and above this size are finished in No. 14 stand (the 15th stand) and delivered to two reels of the pouring type, in which the rod is directed onto a revolving coil plate through a stationary nozzle.

Bars to be sheared into straight lengths are also finished on No. 14 stand and delivered by a hot run-on table extending from this stand to a 270 ft. double sided cooling bed (photo 4). Part of this table, leading to the cooling bed, is easily removed in order not to crowd the working space at the rod finishing mill when it is in use.

The annealing equipment consists of four radiant tube furnaces and 12 bases with inner covers, or shrouds. Six of the bases are for annealing a single pile of rods, and handle coils of 46 in. outside diameter. The remaining six bases are equipped for four or eight piles, and are used for smaller coils, of 8, 12, 16, and 24 in. outside diameter.

Iron Quality as a Problem of

THE problem of producing iron of uniform quality no doubt arose very shortly after the discovery and first use of iron itself. Meteoric iron, one of the earliest used forms of the metal, varies in malleability, and this non-uniformity must have been observed by primitive users. The iron produced from the early crude smelters also varied greatly in composition and properties.

Polybius mentions the poor quality of the iron used by the Celts during their invasion of Italy in 223 B.C. At Addua near Milan, the Romans inflicted upon them a heavy defeat, attributable mainly to the fact that the long iron swords of the Celts were easily bent, and would stand up under only one downward cut. After that the edges got so turned and the blades so bent that unless the Celtic warrior could find time to straighten his blade with his foot against the ground, he could not deliver a second blow. Iron quality was literally a matter of life and death 2200 years ago.

Skipping the intervening centuries, we come, in 1618, to the prototype of the modern blast furnace for iron making, which began to evolve when it was discovered that iron could be smelted with coal instead of charcoal. Between 1798 and 1800, a number of papers on the manufacture of iron, by Mushet, were published in the Philosophical Magazine. These and others were collected and published[1] in 1840.

, In those papers were discussed—with a depth of knowledge that today seems surprising—the effect on iron production and quality resulting from differences in composition of the burden. It was pointed out that the poor iron which was produced when the ironmasters in England attempted to use iron ore high in iron content, instead of a low grade ironstone commonly employed, could be rectified by use of sufficient flux of the proper composition and by the redesign of the squat furnaces then in use to provide a taller and narrower shaft. In such a shaft the reduction zone would be sufficient to reduce the ore completely before it arrived at the hearth. Modern furnace design has followed this recommendation.

As early as 1800 the effect of moisture in the blast on the quality of the iron was recognized[2], and the poor quality of iron produced in the summer months was attributed to moisture in the air. In 1863 Truran's book[3] describing iron making in Great Britain was published. At that time it was clearly recognized that factors other than the ore employed affected iron quality. With regard to atmospheric conditions, it was observed that the direction of the wind influenced the quality and quantity of the iron produced. Truran did not go so far as to recommend a weather vane on every blast furnace, but the implication was there. The idea that moisture-bearing air affects iron quality is perfectly sound, and is still generally accepted.

Thus far only those features of iron quality that apply to iron alone have been considered. With the advent of steel making the problem of iron quality assumed a new and altered significance. The present conception of the factors affecting iron quality will, therefore, be briefly reviewed.

Variables in Iron Quality

When the word "quality" is applied to steel it includes such features as chemical composition, physical structure, physical properties, uniformity, behavior in use, and cost. Iron quality is somewhat different, especially where applied to iron that is to be used for steelmaking. Physical structure and physical properties are not definitely measured, since the metal is usually used in molten form. Behavior in use is a rather intangible property. Cost has been greatly emphasized.

It has been frequently observed in the steelworks that there are some variations in the iron which affect steelmaking that are not explained by ordinary chemical analysis. It appears quite likely that many such variations can eventually be associated with minor chemical constituents. Molten iron has another important quality not usually considered directly a part of steel quality, but which affects steelmaking operations, namely, temperature. This discussion therefore restricts itself largely to the chemical composition and temperature of the iron.

The amounts of the common constituents, carbon, manganese, phosphorus, sulphur, and silicon, vary appreciably from cast to cast. Examination of the analyses of a limited number of casts usually fails to reveal any relationship between the fluctuations of the different constituents. By grouping large numbers of casts within specified ranges for one constituent, however, and then by plotting the average values for any other constituent within these groups against the ranges for the first constituent, smooth curves may be obtained. The result of averaging the large numbers of values has been to cancel the effect of uncontrolled changes in other variables not under consideration. The relationships obtained undoubtedly have a basic significance as far as furnace operating conditions are concerned, and it will be shown later how they are related to iron temperatures.

These interrelationships between the various elements have been studied by Joseph[4], Daeves[5] and others, and have been the subject of considerable investigational work within our own organization. Typical relationships on one of the furnaces included in our studies will be used for illustrations in this paper. In Fig. 1 is shown the relation between sulphur and silicon in iron from a furnace producing high-manganese basic iron, and the relation

*Paper read before the general meeting of the American Iron and Steel Institute, New York, May 26.

the Steel Industry*

By H. W. GRAHAM
and H. K. WORK

General Manager and Manager of Research and Development respectively, Jones & Laughlin Steel Corp.

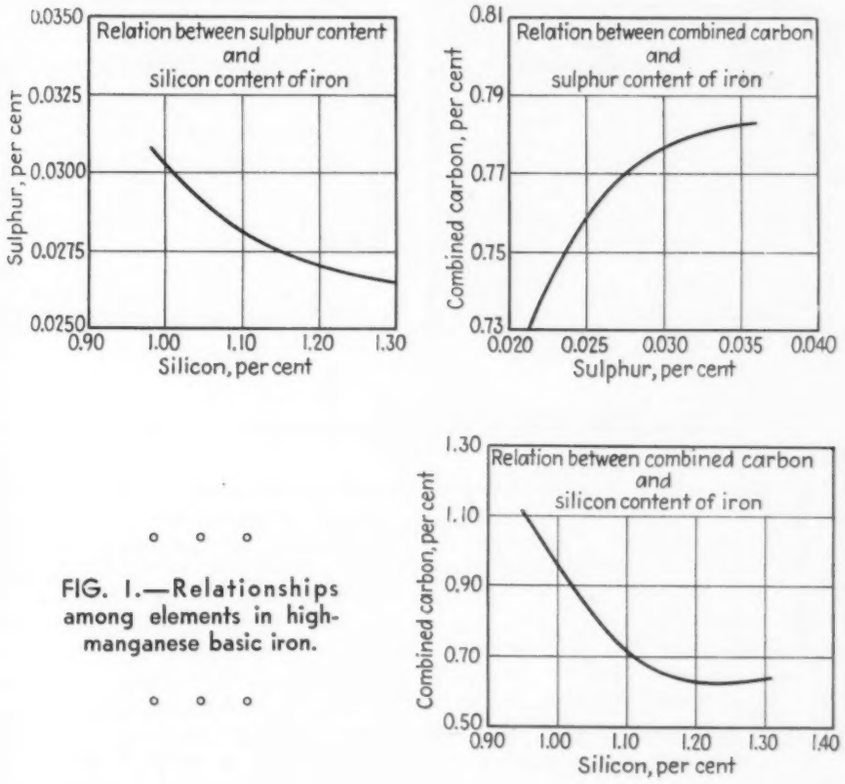


FIG. 1.—Relationships among elements in high-manganese basic iron.

between combined carbon and sulphur and silicon, respectively. As the silicon rises, the sulphur and combined carbon fall, while combined carbon rises with increase in sulphur. It will be brought out later that the amounts of these constituents exert an important influence on steel-making operations.

The relative proportions of combined and graphitic carbon in pig iron are determined by amounts of silicon and other elements, and also by rate of cooling. As iron used in steelmaking is usually added hot, the amount of carbon has generally been the only variable considered, but in foundry work, of course, the form of carbon is also important. Boegehold[6] believes the properties of cast iron, which are dependent upon the amount of combined carbon present and upon the ease with which it is retained by rapid cooling, are related directly to the amount of moisture in the blast. He indicates that the physical characteristics of pig iron persist during remelting in the cupola and greatly affect the cast iron. If such an effect can persist through remelting, it might also conceivably affect steel in its final form.

Nitrogen is taken up in blast furnace iron from alkali cyanides. The formation of these cyanides has been studied by several investigators[7, 8], and it is reported that although carbon and nitrogen are heated together at high temperatures, cyanide compounds form very slowly unless a catalyst is present. It was found that unreduced iron oxides are excellent catalysts. Observations on Swedish blast furnaces showed that when unreduced iron oxides were present in the tuyere zone, the amount of nitrogen found in the iron increased greatly. Normal nitrogen content is ordinarily 0.001-0.004 per cent, but during periods of poor operation the nitrogen content of the pig rose as high as 0.020 per cent. Nitrogen and cyanide formation were discussed[8] before this organization in 1927, and the high temperature required to form cyanides in the hearth was emphasized.

Unreduced oxides in pig iron include those of silicon, iron, manganese, and aluminum. The total amount of these ordinarily present has been given by Herty and Gaines[9] as varying from nothing to about 0.13 per cent, but total oxide contents as high as 0.313 per cent have been reported[4]. An average figure for good operation would probably be near 0.04 per cent. It has been observed generally that higher oxide contents were found to accompany sudden variations in silicon content of the iron, although no definite relation between oxide content and the absolute value of the silicon content has been found.

In addition to the elements commonly found in iron, others may be present. Some blast furnace operators occasionally charge scrap into the blast furnace, and with the increasing use of alloy steels this practice may introduce elements into the iron which would not normally be obtained in appreciable amounts from ore. Furthermore, small amounts of some of the less common elements may be introduced by way of the ore. Not much attention is now being paid to these latter elements, but it is safe to predict that, with the increasing demands on iron quality and on the resultant

steel, they will receive more serious consideration in the future.

The temperature of molten iron is associated with quite a number of factors, including composition and relative proportions of the burden, temperature and volume of the blast, composition and volume of the slag, rate of driving, and desired composition of the iron. Recent studies[4] have shown quantitatively what every blast furnace operator realizes, that high silicon and low sulphur accompany high temperature of reduction of the iron. Furthermore, the limy slag which may be used for very low sulphur iron will not perform its desulphurizing function efficiently unless viscosity is reduced by means of high temperature. For the same reason, iron ore containing titanium, vanadium, or chromium requires a high furnace temperature to maintain liquid the relatively infusible slags formed by these elements.

In studying the influence of furnace temperature upon iron quality, Wagner[10] found that pig irons smelted under conditions differing in no particular except that of blast temperature, and having identical compositions, exhibited somewhat different properties. It was difficult, however, to trace such differences to the variations in temperatures.

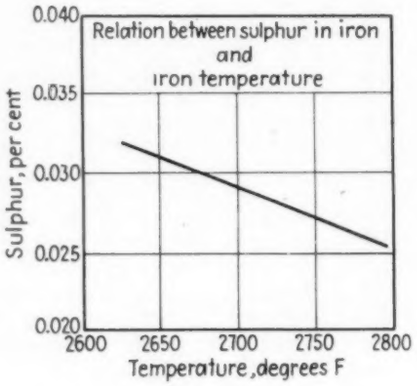
As a part of the investigations in our own company, the relationships between the temperature of iron in the runner and the composition of the iron have been determined, and the results for sulphur, silicon, and combined carbon in a furnace producing high manganese basic iron are shown in Fig. 2. It is apparent from these curves that furnace conditions, as reflected in the resultant iron temperatures, have had a marked influence on iron composition. In addition to its influence upon iron composition temperature also obviously affects directly the making of Bessemer steel.

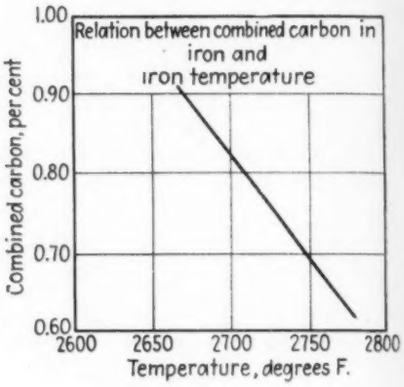
Causes of Variations in Iron

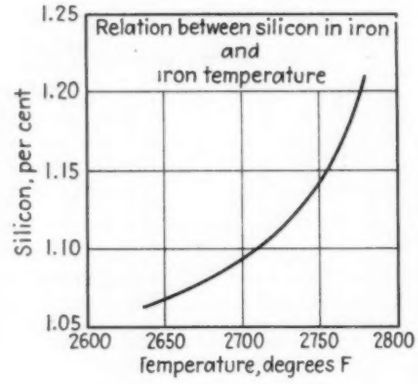
Temperature, density, and moisture content of the air utilized in the blast are significant factors in blast furnace operation. As noted in the introduction, the importance of these atmospheric conditions in iron making was appreciated 140 years ago. Suggestions[11] for drying the blast were advanced in 1853, and two methods for doing this had been proposed before Gayley began his experimental work in 1890. Gayley[12] employed mechanical refrigeration to cool the air below the dew-point, thus precipitating moisture. Since then, several schemes making use of calcium chloride as a desiccating agent have been tried. At an installation in Scotland, silica gel[13] has been employed as a drying medium; activated alumina has also been proposed for the same purpose.

Moisture carried into the furnace by the blast requires heat for its dissociation; furthermore, dry cold air has a greater density than warm moist air, and so carries into the furnace a greater weight of oxygen. Both of those facts indicate that moisture in the blast, which is present in larger amounts under the atmospheric conditions of warm sultry days, tends to chill the furnace. Gayley and other investigators also pointed out the marked variation in moisture content of the air from day to day and even hour to hour, and stated that this variation was perhaps even more troublesome than the absolute value of the moisture.

Movement of the burden in the blast furnace is relatively slow; changes made in charging do not affect furnace operation appreciably until after a number of hours. Thus rapid fluctuations in moisture content of the air, and the temperature in the hearth, cannot possibly be compensated for by corresponding changes in the fuel content of the burden. As a result all blast furnaces must be run with a safety factor in burden composition sufficient to take care of the worst moisture conditions that would normally arise. This means, of course, that a furnace cannot be burdened for maximum efficiency if the blast density and moisture content are constantly varying. Neither can the temperature be maintained constant.







A glance at the silicon and sulphur curves in Fig. 2 shows the effects of variation in the temperature of iron in the runner upon the silicon and sulphur content. It seems safe to assume that changes in the shaft temperature due to variations in moisture content exert a marked influence on the iron composition. Nevertheless, in spite of the recognized effect of moisture, it is not considered practical to dry the blast because of the expense involved.

Moisture in the blast has been objected to primarily because of its action on furnace temperature, but it is at least possible that hydrogen is introduced in the iron from this source While this hydrogen should to a large extent be lost at high temperatures, it is not at all impossible that some small amount remains and finally affects the properties of the resulting steel.

During the last ten years or so, a great number of investigators[14-21] have concerned themselves with the physical distribution of the burden in the furnace stack and the flow of gases through the burden. These investigators have been interested more in

the efficiency of the furnace than in quality of product, but it is true that efficient and regular operation of a furnace will generally result in a product of more uniform quality.

Irregular movement of the burden, resulting from scaffolding, slipping, etc., affects adversely iron quality in several ways. Such irregular movement may carry unreduced ore into the hearth, thus increasing the oxide content of the iron. Uneven gas distribution in the stack may have the same effect. Investigation[7] into the formation of cyanides shows that a movement of unreduced oxides of iron into the tuyere zone will greatly increase the formation of cyanides, and likewise the nitrogen content of the iron.

In addition, it has been shown[8] that a great amount of heat is required for cyanide formation; the presence of unreduced oxides and the resultant formation of cyanide, therefore, would have a cooling effect. The tendency towards the formation of shrinkage cavities in castings made from blast furnace iron was decreased by increasing the rate at which the ore burden traveled through the furnace[6]. This speed is, naturally, affected by the size and distribution of the burden.

Physical condition of the burden depends not only on size and distribution, but also upon the physical properties of its three elements, ore, limestone, and coke. To test this characteristic a method[22] of evaluating reducibility has been developed. It was found that reducibility varied directly with porosity, a property which may be measured rather easily. Both reducibility and porosity vary with the size of ore lump. It has been suggested that the ore for the burden be crushed to such sizes as will exhibit a uniform porosity, the absolute value of which would, of course, depend on other conditions of furnace operation. By crushing large lumps of ore to this determinable size, and sintering fines, a very uniform ore burden should be obtained, with consequent beneficial results in uniformity of furnace operation and more uniform composition of iron.

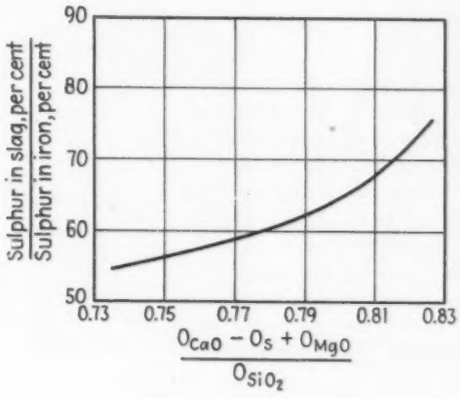
AT LEFT

FIG. 2.—Relationships between iron composition and temperature in high-manganese basic iron.

o o o

AT RIGHT

FIG. 3.—Effect of slag basicity on sulphur ratio.



With regard to limestone,[23-24] the important physical property is its resistance to crushing on calcining. It is obvious that a stone which crushes easily to a powder on calcining will give different results than one which retains its shape. Sizing of the stone likewise is said to promote smoothness of operation.

Coke in most blast furnace plants is subjected to a shatter test, and is screened for uniformity. Other tests which have been proposed and used as measures of the physical quality of coke are the critical air blast, the wet oxidation test, apparent density, apparent porosity, combustibility, and reactivity tests[25]. As in the case of limestone, physical strength of coke is important, and also its rate of combustion. The burning rate of coke determines in part the rate at which the burden travels through the furnace.

Although a good start has been made in investigating the effects of the physical properties of the materials of the blast furnace burden on furnace operation, in general our knowledge is far from complete, and, with regard to the quality of the iron produced, is fragmentary.

It is possible to exercise a considerable degree of control over the physical conditions of the burden by sizing the materials charged, sintering or in some cases briquetting coke dust, ore fines, and flue dust, etc. Control over the chemical composition of the burden is accomplished by mixing raw materials from various sources to obtain the best average composition possible from given sources of supply. Furthermore, the relative amounts of the various materials must be carefully proportioned to form a slag of the most suitable composition, since the slag exerts a marked effect on the composition of the iron produced. This relationship, as it affects the ratio of sulphur in slag/sulphur in iron to slag basicity, is illustrated in Fig. 3.

Ores must be carefully selected to give an iron suited for the particular steelmaking process in which it is to be used. As mentioned before, the presence in the ore of certain elements such as titanium, chromium, and vanadium results in highly infusible slags which derange blast furnace operation. The presence of impurities in limestone also results in unnecessarily large slag volumes which hamper regular operations.

Both the sulphur and the ash contents of coke have a direct bearing on iron quality. The sulphur in cast iron is obtained directly from the coke, and it may be reduced in the hearth only by close control of temperature and of basicity of the slag. Influence of the ash content of coke has been investigated[26]. A variation in ash content of the coke from a minimum of 9.57 per cent to a maximum of 15.84 per cent caused a variation in the sulphur in the iron from 0.030 per cent to 0.194 per cent (at the top of the cast) during a period of only 24 hours.

This large variation in sulphur content for a relatively small variation in ash content is explained by showing that an increase in ash content of the coke is cumulative in effect: The increase in ash decreases the percentage of total carbon in the coke, and at the same time increases the weight of slag formed. This in turn requires an increased amount of carbon to raise it to its melting-point and then heat it to furnace temperature, thus reducing considerably the carbon available for other necessary chemical and thermal reactions of furnace operation.

Other investigations[27] of this subject showed a relationship between variations in percentage in coke ash and variations in the silicon and sul-

(CONTINUED ON PAGE 59)

New Devices for Plant Service

By FRANK J. OLIVER
Associate Editor, The Iron Age

AMONG the new equipment to protect the plant and the worker are two types of gates, light weight fireproof partitions, safety tread, and a number of ventilating fans. Two smaller diesel power units are available for portable and stationary use, and there have been a number of interesting developments for handling compressed air economically. A line of centrifugal pumps has been introduced for handling industrial wastes with suspended solids. Other items relate to lubrication devices and miscellaneous equipment for general industrial plant service.

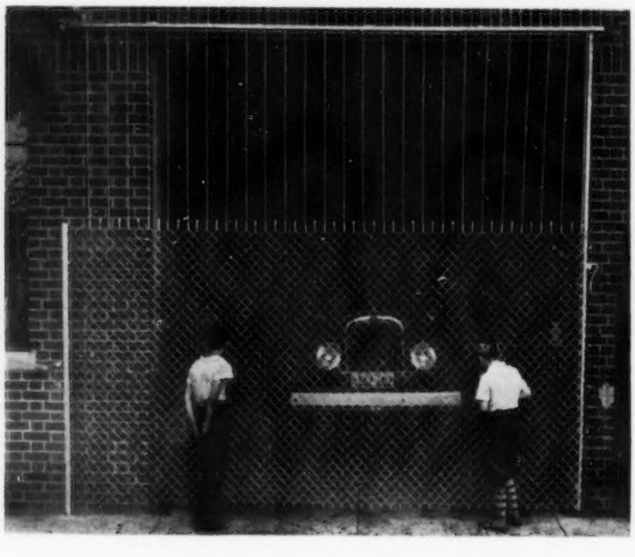
FOR plant protection, two types of factory doors of the less expensive type have been placed on the market in recent months. One is a flexible sliding grille of chain link mesh, made by the *Cornell Iron Works, Inc.*, Long Island City, N. Y., and the other is a vertical lift door made by the *Kinnear Mfg. Co.*, of Columbus, Ohio. Both are illustrated. The latter company has also announced a remote controlled motor driven gate operator for sliding types of gates. By means of a momentary contact switch, the gate can be controlled from a distance at a speed of 2 ft. per sec. Drive is by an endless roller chain, and the motor is provided with a slip clutch to prevent damage if an obstruction is met. Operating parts are protected against the weather by a metal housing.

Johns-Manville announces a new type of insulated industrial curtain wall for steel frame factory buildings, consisting of an application of 1 in. of insulating board encased between 1/8 in. veneer of asbestos Flexboard, over which is applied a wall of corrugated Transite. Both facings are of asbestos-cement composition, providing fireproof walls, capable of withstanding relatively high temperature without melting or buckling. The insulating value is equivalent to 14 in. of common brick. Units of encased insulating board are held against the steel framework by cadmium plated bolts and gray caulking compound is applied to the sheet intersections.

Electric furnace abrasive grains are applied to cast iron, bronze or aluminum by a special process of casting to give an improved type of non-slip safety metal for flooring and stair treads. Besides being unaffected in its non-slip properties by oil or water, the material is highly resistant to rust and acid corrosion. It is being manufactured by the *American Brake Shoe & Foundry Co.* under the trade name, Non-Slip Absco Metal. The abrasive grains are uniformly bonded in the metal and protrude sufficiently above the metal to give a "bite." Sluffing out and loss of abrasive grains along the nose of the tread are said to be eliminated as the abrasive grains are carried entirely over the nose and concentrated at this slipping point.

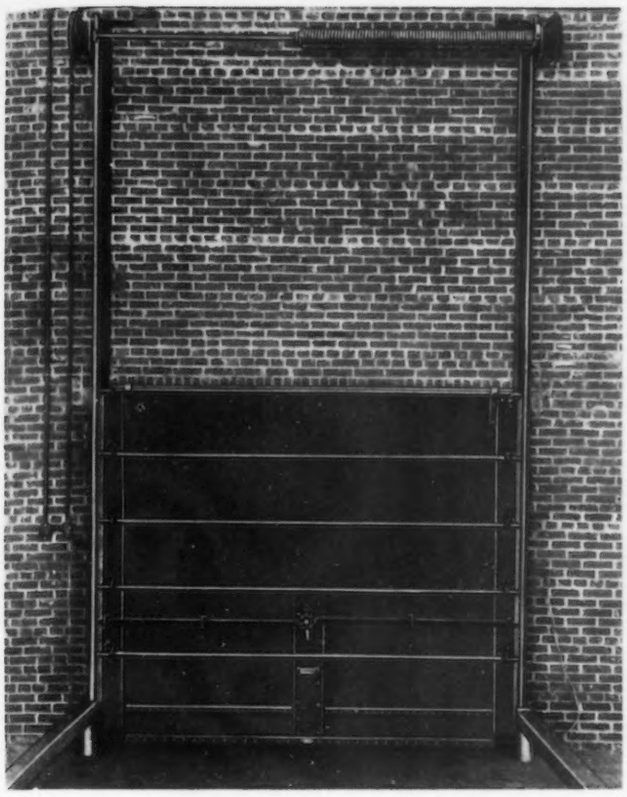
Ventilating Fans

A number of similar types of ventilating fans, ranging in size from 12 to 36 in., have recently been announced. They all employ single-speed, inclosed motors. The *Emerson Electric Mfg. Co.*, St. Louis, has brought out a line of popular priced exhaust fans with sleeve bearing motors, wool packed for continuous operation with only occasional lubrication. This style has nine overlapping steel blades. The W F D exhaust fans, made by the *Binks Mfg. Co.*, 3114 Carroll Avenue, Chicago, are a five-bladed type. Explosion proof motors are furnished in common specifications.



AT LEFT

THE Cornell sliding grille is a flexible steel (or aluminum) curtain hung from an overhead track. Made of galvanized chain link mesh suspended on vertical galvanized rods, the grille will nest in a space less than 1/6th of the opening width. It will also slide around a sharp curve.



THE Kinnear vertical sliding all-steel Rol-Top door is made up of heavy galvanized, copper bearing steel sections provided with ball bearing rollers at the ends engaging vertical steel tracks. Counterbalance is by a torsion spring connected to the door by heavy steel cables and drums at each end.

ABRASIVE grains cast in metal form the basis of the non-slip Absco safety tread. Style No. 512, shown, has open slots that let foreign substance pass through, making it self cleaning.

ABOVE

THE new line of Emerson sleeve bearing exhaust fans comes in sizes from 12 to 30 in.

AT RIGHT

THE Emerson Man Coolers are available in 24 and 30 in. sizes with four types of mounting accessories. Protected with heavy gage 1 in. mesh on all sides, they have ball bearing motors that need be lubricated only every 6000 hr.

Two, four and six blade types of Dynaflow fan units are being offered by *South Bend Air Products, Inc.*, 322 E. Colfax Avenue, South Bend, Ind. Fan blades are aluminum alloy drop forgings, and are designed to produce uniform air velocity across the working portion of the fan disc. Intake rings are designed to prevent backflow and to reduce tip losses in the blades. Motor supports are of rolled steel. A line of portable units suitable as man coolers is also made under the trade name, Aerospot.

Diesels for Industrial Use

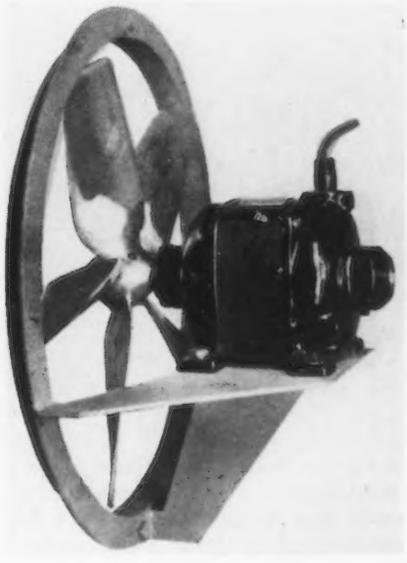
The *Caterpillar Tractor Co.*, Peoria, Ill., has added two new sizes to its line of industrial diesel engines. Both are four stroke cycle, valve-in-head, water-cooled design with solid fuel injection into precombustion chambers. The D4600 model, rated at 66 hp. at 1400 r.p.m., is a six-cylinder type suitable for driving ¾-yd. shovels and draglines, or a 35-kw. generator. The D3400 model is a four-cylinder type developing 33 hp. at 1525 r.p.m. and suitable for powering ⅜-yd. shovels and small industrial locomotives or driving a 15-kw. generator. Both diesels have small auxiliary gasoline engines for starting. The fuel injection system is similar to that on all Caterpillar diesels and the valves are preset at the factory.

ABOVE

DYNAFLOW fan units are supplied in four and six blade types and from 16 to 36 in. size, having air deliveries of 1240 to 26,000 c.f.p.m.

AT RIGHT

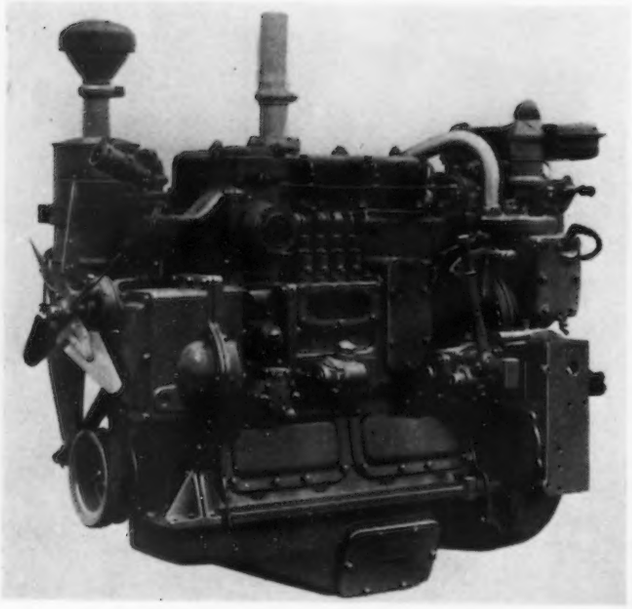
THE Binks line of ventilating fans are available in sizes from 18 to 34 in.



Compressor Developments

The *Metallizing Co. of America, Inc.*, 1351 E. 17th Street, Los Angeles, has developed the Mogul compressor head for Ford model A or B engines, converting such engines into compressors of 100 cu. ft. per min. capacity at 100 lb. pressure. Either an electric or gasoline motor of 20 hp. at 1200 r.p.m. is required to drive. A formed steel frame can be supplied for motor and compressor mount.

A control that responds to the rate of air usage has recently been applied to the *Sullivan* WN-112 air and gas compressor. When maximum capacity is required, the synchronous compressor motor runs continuously and the compressor itself is loaded and un-



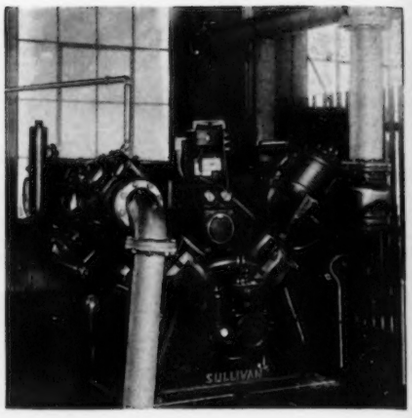
ABOVE

THE D3400 diesel engine is a 33-hp. model, smallest of the current Caterpillar line of industrial diesels.

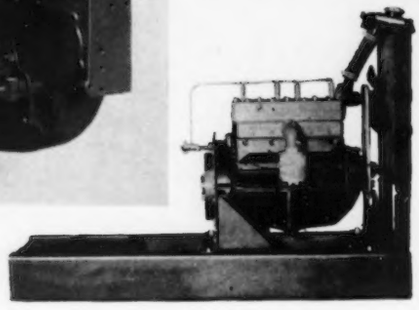
o o o

AT RIGHT

AN adjustable pressure differential on the Sullivan WN-112 air compressor allows the terminal pressure to be held to close limits during peak operation, and allows the motor to shut down when the air demand is light.

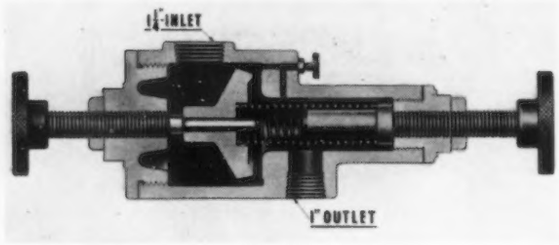


o o o



ABOVE

THE Mogul head with air strainer, unloader and pilot valve is used to convert Ford model A or B engines into an air compressor of 100 cu. ft. per min. capacity.



THE Murray-Lorge automatic cut-off valve operates on the **principle of equalization.** As long as the pressure on the inlet and outlet are nearly equal, the plunger is held in the open position. A sudden break causes it to close.

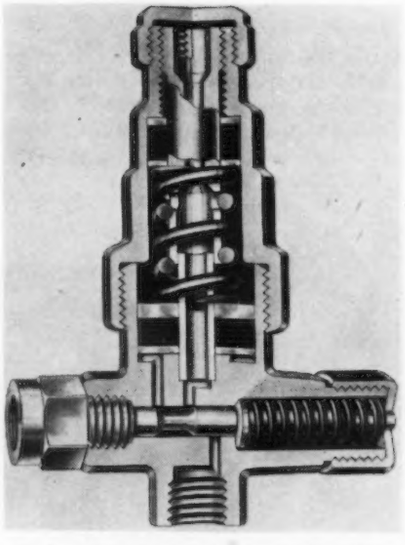
o o o

THE Gardner-Denver non-clogging centrifugal pump is designed to handle industrial wastes in which solids are suspended.

loaded to maintain the air pressure between 98 and 100 lb. When the sampling feature indicates that the rate of air usage is low, the motor stops and does not start again until the air pressure drops a predetermined amount, usually 10 lb.

For air compressor service where oil is present in the line, the *Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.*, Passaic, N. J., is offering its Grenadier G.O.P. air drill hose with an inner tube of synthetic rubber. This gas-oil-proof material will not deteriorate in the presence of oil. The hose is well constructed with two or three braids of long staple cotton cord, between which are placed sheets of live rubber, vulcanized into the cords. The cover is abrasion resistant black rubber. The hose is supplied in sizes from ¼ to 2 in.

The Triple S hose clamp, made by the *Specialty Sales & Service Corp.*, 138 Holden Street, Minneapolis, originally designed for grease hose connections, is now being applied to air hose connections. The device consists of a flexible strap that is wound around the hose three times and anchored in place with a self-locking key.



THE mill type injector used in the Lincoln single Felx-O-Matic lubricating system can be adjusted up to full capacity of 0.132 oz. per shot.

An automatic valve that immediately shuts off the supply in an air or other fluid line when there is a break in the hose is being manufactured by the *D. J. Murray Mfg. Co.*, Wausau, Wis., under the trade name, Murray-Lorge. The valve may be adjusted to shut off the flow at any desired pressure at the inlet or size of break at or below the outlet. It is designed to promote the efficient use of tools wherever flexible hose is used.

Non-Clogging Centrifugal Pumps

A line of non-clogging centrifugal pumps applicable to industrial fields and manufacturing processes requiring the handling of liquids in which

ABOVE

THE American Chain & Cable Co., Inc., York, Pa., announces four gun type Acco-Morrow pressure lubricators supplying pressure over 1000 lb. per sq. in. and six other models supplying over 500 lb. pressure. The Oilingseal tip, made of compressible composition, makes a pressure-tight contact on the oil hole or cup. Pressure is developed by a hand plunger.

o o o

AT RIGHT

A METHOD of attaching pipes to containers without having to get on the inside is offered with the front drive pipe connector, made by the Multi-Seal Mfg. Corp., 123 N. Jefferson Street, Chicago. The compression cylinder takes the convex curvature of the drum surface and is moved up on the shank taper, expanding in place, when the action nut is tightened.

o o o

AT RIGHT

PAINTCIL is paint formed into sticks so that it may be used as a pencil for marking. A product of Helmer-Staley, Inc., 325 W. Huron Street, Chicago, it writes on any surface that will take liquid paint, including hot strip coils.

BELOW

BY a combination washing and filtering process, recovery up to 90 per cent of crankcase oil is claimed for this oil reclaimer made by the Bucyrus-Erie Co., South Milwaukee. Carbon, waxes, tars, resins and acids are removed. Transformer oil, heat treating oils and other industrial oils also can be reclaimed with this unit.

BELOW AT RIGHT

THE Alnor forewarn detector equipment, manufactured by the Illinois Testing Laboratories, Inc., Chicago, has been modified and adapted for industrial use to detect the presence of tramp iron or steel in non-metallic products. A micro control permits adjustment of the sensitivity of the electronic signal device.

o o o

AT RIGHT

THE new aluminum alloy shovels made by the Wood Shovel & Tool Co., Piqua, Ohio, are light in weight, acid-resisting, non-corrosive and non-sparking. The general service type is shown.

o o o

with cycle variation from 2 to 180 min. The mill type injectors, illustrated, are externally adjustable, as are the super-duty injectors for exceptionally large bearings. Standard injectors are available in four standard capacities.

During the initial pressure stage, a slide valve exposes ports, allowing the measuring chamber to be filled under a Linpak piston, at the same time discharging material above it into the bearing through a center tube. After a bleeder valve has reduced the pressure to normal, the slide valve returns to its original position and connects ports so that lubricant under the piston is forced up through the center tube to fill the space above the piston for the next charge.

Trico Fuse Mfg. Co., Milwaukee, announces a line of constant level oilers for automatically maintaining an accurate level of oil in ring and ball bearings. Made in four sizes, Levomatic oilers have a glass reservoir screwed to a cadmium plated bronze fitting, so that they can be readily removed and refilled.

solids are held in suspension, is announced by the *Gardner-Denver Co.*, Quincy, Ill. Designated as types J and K, these pumps are built for both horizontal and vertical dry pit installations. The impeller is of the side suction enclosed type, has two streamlined blades and is made of alloyed cast iron. Casing and frame are of high strength cast iron. Disk or flat type renewable double wearing rings are provided on the impeller and front head. The stuffing box is a separate casting and holds six rings. The shaft is supported on heavy duty double row ball bearings suitably enclosed. For vertical installations, shafting, compression and flexible couplings and guide bearings are furnished.

The *Lincoln Engineering Co.*, St. Louis, has developed the Flex-O-Matic single line injector lubricating system consisting of a lubricant compressor (manually, electrically or air operated), and a single supply line leading to the injectors at or near the bearings to be lubricated. With power operation, control may be by push button or by an automatic timing device,

Annealing

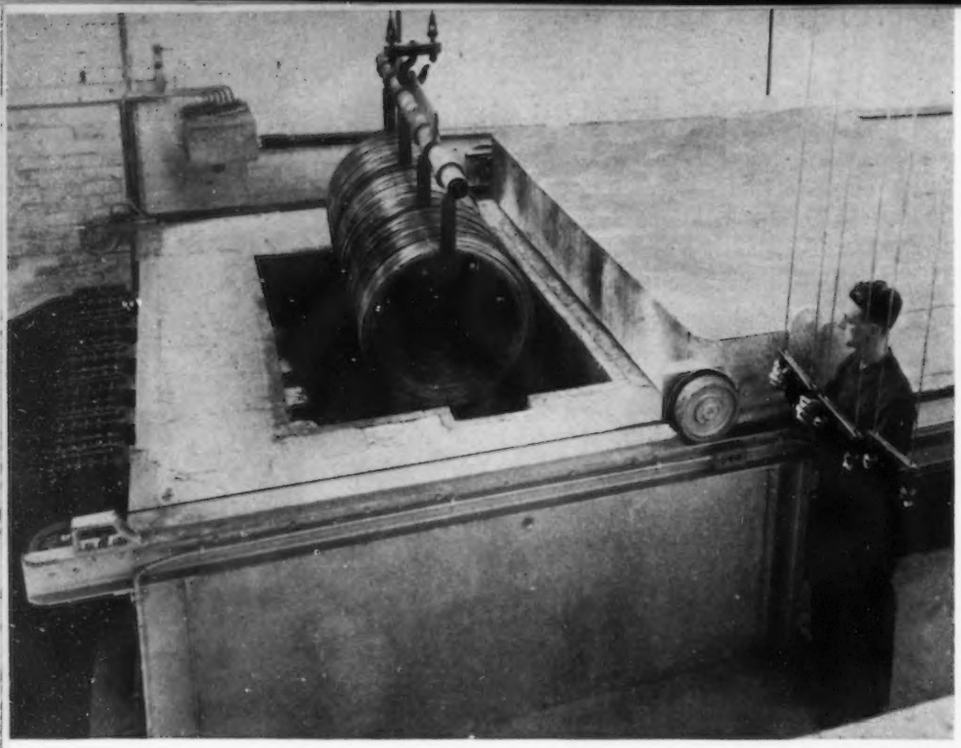


FIG. 1—The annealing furnace; this view shows the molten salt bath and the electrical heating elements immersed in the bath.

THE Lavite annealing process gives complete freedom from smoke and fumes, excessive heat, soot, and so on. In brief, it is a procedure wherein annealing is accomplished by immersion in a bath of molten salts heated by the passage of an electrical current through the salts. The cost of current often forms a large part of the cost of heat treating by electricity, but in the Lavite procedure the ease of controlling temperature, the facility with which the power may be turned on and off, and the high thermal efficiency ensure overall low operating costs.

The Lavite furnace is virtually a heat storage system and, therefore, in many instances advantage can be taken of off-peak rates for electrical energy.

Many industrial rates for electricity charges are based upon the peak load or the maximum demand at any time during the day. Therefore, it is evident that the more current that can profitably be used during off-peak times, the greater is the power economy. Further, many utilities are prepared to quote specially low rates for a load which has a good power factor. Lavite furnaces operate with a power factor approximately 0.96, and this, when taken in conjunction with the ordinary factory load, in the majority of cases, has the effect of improving the overall power factor of the supply to the factory, with a consequential reduction in the average price paid for electricity for all purposes.

The Lavite salt serves as agent for heating the wire immersed in the bath and as a means of storing heat energy.

This method gives uniform heat, it entirely prevents oxidation or scaling, and owing to the fact that all the coil is in the furnace at the same time, no single strand or part of a coil can be over or under heated as no steep temperature gradient is used to give quick heating. The result is a very uniform metal structure.

All parts of the Lavite bath are maintained at a constant temperature. The large heat content of the bath makes the heat variation small even when a large load of work is added to a relatively small bath. This heat inertia is the reason why such temperature uniformity is obtained and is also the reason why the electrical energy may be used at will.

A Lavite unit has been installed in the new plant of John Rigby & Sons, Bradford, England; this is the second of this type of furnace installed by this company, the first being in use at its Heckmondwike plant for the annealing of wire for the bolt and rivet trade, and the results in both instances are of much interest.

The wire for the bolt and rivet trade is ½, ⅜, 5/16 and ¼ in. in diameter, and is heated to a temperature of 1328 deg. F. The time of immersion is 10 min. and there is 15 min. of cooling prior to quenching. With this annealing cycle wire is being obtained with a tensile strength of about 45,000 lb. per sq. in. and an elongation of 40 to 50 per cent on 2 in. test pieces.

At Rigby's new plant, fine wire for a much wider range of products is produced. This includes wire for bed springs and mattresses, box binding,

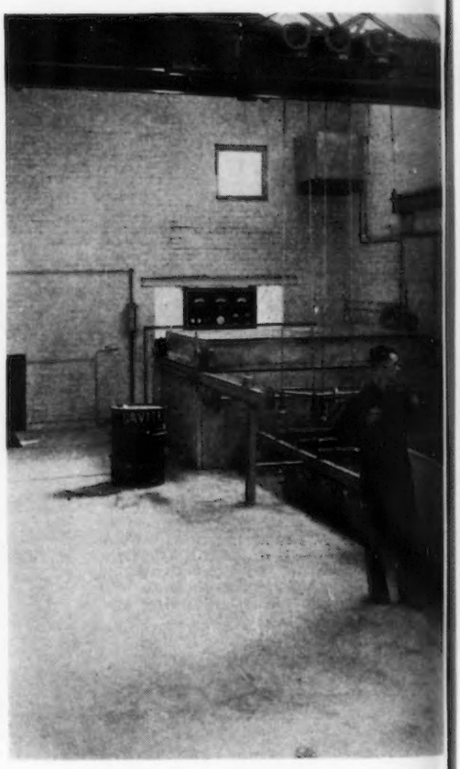


FIG. 3—After two water dips the wire coils are here, and finally dipped into

reed and broom wire, and wire for springs, weaving, chains, nails, bails, cores, cold heading wire, welding wire, crimping, spoke, stapling, tack and link wire and cap screw wire. The annealing temperature for this type of product is 1300 deg. F., and the cycle takes 15 min.

The three photographs show this installation. Fig. 1 is of the annealing furnace proper, and shows the bath of

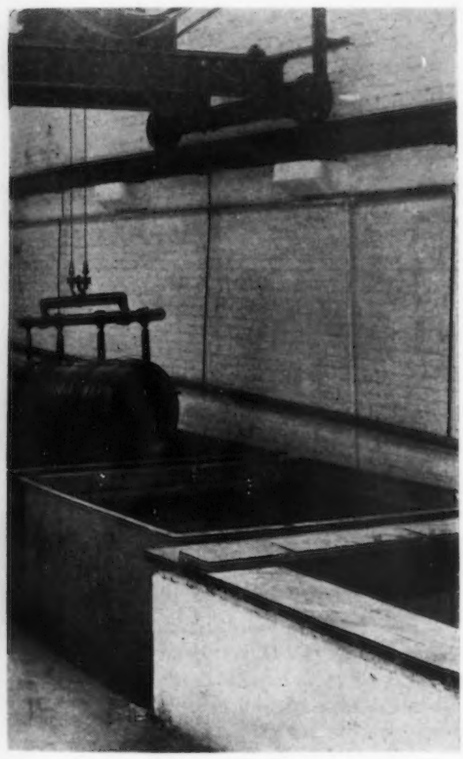
Fine Wire in Britain

By FRANCIS A. WESTBROOK
Consulting Engineer, Benson, Vt.

molten salt with the electrodes extending into it, together with the transformer connections. The electrodes are water cooled in order to reduce power consumption. The method of heating, of course, is by passing current from the electrodes to the metal walls of the salt container; these walls are carefully heat insulated in order to minimize heat losses and to keep the atmosphere of the room from becoming over-heated. The illustration shows a half ton of coiled wire on a yoke, the whole being lowered by means of an electric hoist into the bath. The cover of the furnace is rolled aside by means of a motor controlled by the push buttons shown directly in front of the operator. The ends of the yoke rest in the slots at each end of the furnace and permit of the complete submersion of the coils. There is no question of external heating; and when the whole mass of molten salt and the walls of the furnace have been raised to the desired temperature there is a sufficient reservoir of heat to prevent a material temperature drop when the furnace is loaded with a cold charge. Thus, the heating is imparted to the wire in so uniform a manner that high tensile strength and high ductility of the steel is always under control.

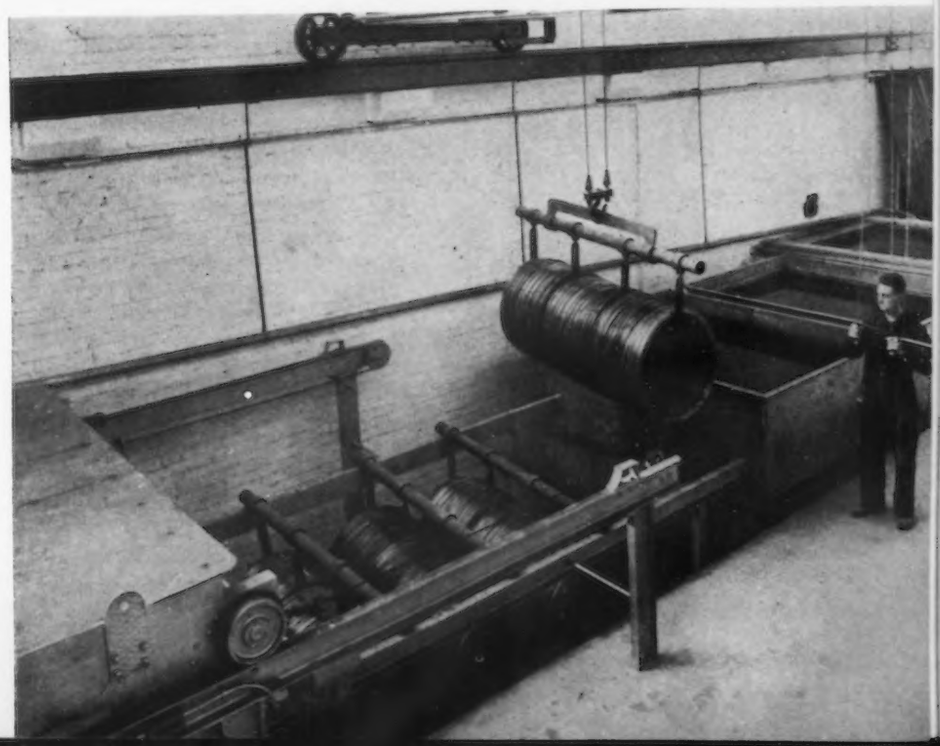
Fig. 2 shows the furnace with the lid closed. In the center is a rack on which yokes full of coils of wire are accumulated for subsequent immersion in the annealing furnace. Fig. 3 shows three of the dip tanks. The first two contain water. When the wire is removed from the annealing furnace it is taken by means of the overhead traveling electrical hoist and dipped in the first tank. This dissolves the salt carried by the coils from the furnace, and the liquor which results is run into an evaporator where the salt is recovered and returned to the furnace. The second quench tank is to insure complete dissolving of all the salt. It is supplied with an external supply of cold water as it feeds constantly into the first tank in order to compensate for the withdrawal of liquor to the evaporator. The third bath shown in Fig. 3 is one of acid in which the coils are dipped for only one-half to one minute. The coils are next rinsed, dipped into a hot solution and dried. The final result is a soft annealed wire with a bright surface free from scale and pitting.

As the previous pot annealing method formerly required 24 hr. in the furnace, and actually three days waiting to load and unload the pots, the advantage of this quick and better method is obvious. It has led to an increase in business due to the quick deliveries which it has made possible, as well as to price advantages because of the fact that a premium on the price is warranted because of the improved product resulting.



immersed in a slightly acid water bath, as shown hot water cleansing bath and dried.

FIG. 2—Coils of wire are accumulated on this rack for subsequent immersion in the annealing furnace, which is shown to the left with the lid closed.



Optimism is Keynote of Foundry Convention

DESPITE the fact that the present rate of operations in the nation's foundries is admittedly below the break-even point, optimism was definitely the keynote of the 42nd annual convention of the American Foundrymen's Association that was held last week in Cleveland. The number of foundrymen, their guests, and exhibitors that registered at the auditorium where the technical sessions and equipment exhibition were housed was in excess of 5500. An additional 5000 persons from local plants, trade schools, etc., were reported to have visited the equipment exhibition during the five days it was open.

The annual business meeting of the association was held on Wednesday. Marshall Post of Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., was elected president and Henry S. Washburn of Plainville Castings Co., Plainville, Conn., was elected vice-president. The retiring president of the association, Hyman Bornstein, Deere & Co., Moline, Ill., was elected to the board of directors. Others elected to directorship were H. S. Hersey of C. O. Bartlett & Snow Co., Cleveland; F. A. Lorenz, Jr., of American Steel Foundries, Chicago; G. A. Seyler of Lunkenheimer Co., Cincinnati, and D. O. Thomas of Bendix Aviation Corp., South Bend, Ind. C. E. Hoyt continues as executive vice-president, D. M. Avey as secretary-treasurer, R. E. Kennedy as technical secretary, E. O. James as director of the hygiene and safety section, N. F. Hindle as assistant technical secretary and J. Reininga as assistant secretary-treasurer.

Charles R. Hook a Speaker

The Board of Awards address, which is to become an annual feature of the business meeting, was made by Charles R. Hook, president of American Rolling Mill Co. and president of the National Association of Manufacturers, whose subject was "Some Management Opportunities and Responsibilities."

Stating that incentive was the primary force behind the development of the United States from a loose federation of trading colonies to the most powerful industrial nation in the world, Mr. Hook pointed out that the encouragement of that incentive rather than the stifling of it was the action that would bring recovery to the country.

"Give us a confidence-building policy on the part of Government," Mr. Hook said, "a reasonable answer to the specific problems relating to labor legislation, taxation, Government competition, Government expenditures, and especially efficient handling of relief funds through local participation and control, and I believe we should witness a revival of manufacturing production, and of the consumption of agricultural products that would in a year make us almost forget our present depression."

F. A. Lorenz, Jr., Honored

At the annual banquet, held on Wednesday evening at Hotel Cleveland, the Joseph S. Seaman Gold Medal was awarded to F. A. Lorenz, Jr., president of American Steel Foundries, Chicago. The Board of Awards in presenting the medal, cited Mr. Lorenz for his leadership and many accomplishments in the management and commercial phases of the casting industry.

New Trend in Foundry Industry

Aside from the optimistic sentiment that pervaded all activities at the convention—the equipment exhibition, the technical sessions and the dinner table conversations of the visiting foundrymen—the most striking aspect of the occasion was the manner in which the number and caliber of the new machines, new metals and new methods introduced at the show drove home the fact that the casting industry is unquestionably entering a new era—an era that will see many new types of cast metals and more exact control of the characteristics of the metals in use today. It will be an era of intensive mechanization.

An example of this trend is found in the paper read by Duncan P. Forbes, president, Gunite Foundries Corp., Rockford, Ill., at one of the

H. S. WASHBURN

New Officers of American Foundrymen's Association

MARSHALL POST, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., president; Henry S. Washburn, Plainville Castings Co., Plainville, Conn., vice-president.

MARSHALL POST

malleable sessions. Mr. Forbes' paper marked the first public disclosure of his corporation's method of producing spheroidized pearlitic malleable iron. This iron is marketed under the trade name Z-Metal, and, although it has been produced accidentally by malleable foundrymen for many years, it is only recently that attention has been directed to its commercial value. Z-Metal was described as being produced from white cast iron containing elements retarding graphitization, in which metal the massive cementite has been decomposed and the carbide incompletely graphitized, resulting in a microstructure containing temper carbon and spheroidized cementite in a matrix of ferrite so distributed as to be substantially homogeneous.

Methods of Heat Treating

To produce this type malleable, a white iron metal is prepared, usually in an air furnace, with an analysis that averages 2.43 per cent total carbon, 1.03 per cent silicon, 0.34 per cent manganese, 0.08 per cent sulphur and 0.15 per cent phosphorus.

After the castings have been poured and cleaned they are subjected to heat treatment that generally consists of the five following steps: (1) Heating to a holding temperature of about 1700 deg. F. (2) Holding at this temperature for a time sufficient to decompose massive cementite completely. (3) Cooling rapidly to a temperature below the critical range to produce a fine grained pearlite in the matrix. (4) Holding the castings at a temperature in the "spheroidizing range." (5) Cooling the castings rapidly to room temperature.

Tests conducted by Mr. Forbes revealed test bars with an ultimate tensile strength as high as 87,150 lb. per sq. in. Elongation on this bar was 13 per cent.

Short Cycle Malleable

At the same session, W. D. McMillan, metallurgist at the McCormick plant of International Harvester Co., presented a paper entitled "Production of Short Cycle Malleable Iron." The paper covered the production of fully annealed malleable iron in a cycle of about 14 hr. The silicon in this iron runs somewhat higher than in regular malleable as this higher content promotes graphitization and in this manner operates to shorten the anealing time. This type of iron shows a yield point of approximately 44,000 lb. per sq. in. Tensile strength ranges from 55,000 to 60,000 lb. per sq. in. with an elongation of 15 to 20 per cent. The chief interest in this metal lies in its lower annealing costs and high tensile properties.

Steel Committee Report

At the steel casting conference on Tuesday, H. D. Phillips of Dodge Steel Co., Philadelphia, read the annual report of the committee on methods of producing steel for castings. Among the noteworthy developments of 1937 listed in the report were the use of a cupola furnace for premelting open-hearth scrap (one producer is at present installing this type equipment), the hollow arc method of producing stainless steel developed by Ludlum Steel Co., and the use of a high frequency induction furnace for slagging operations. The report also noted that interest in the converter process seems to be expanding.

In the report of the heat treatment committee of the steel division, presented by D. C. Zuege, Sivyer Steel Casting Co., Milwaukee, it was stated that from the standpoint of furnace equipment the most important development of the year was the new construction features embodied in a five-zone continuous heat treating furnace* installed during the year for heat treating manganese steel castings. The report also noted that there had been improvement in both the technique and mechanical equipment required for successful flame hardening.

Gray Iron Report

At the gray iron session on Monday evening, C. K. Donoho of American Cast Iron Pipe Co., Birmingham, and C. F. Greene of Atlantic Refractories Co., Macon, Ga., reported the results of their investigation on the effect of blast pressure, nature of charge, etc., on the consumption of refractories in the melting zone. The conclusions drawn by the investigators was that high blast pressures lower the life of refractories because of the effect of pressures on the degree of oxidation of the molten metal. Melting low silicon iron, the authors also found, adversely affected the consumption of refractories inasmuch as high percentages of silicon retard oxidation. Other factors that give rise to excessive attack of the lining of the melting

*THE IRON AGE, page 41, July 22, 1937.

zone were said to be long heats and small diameter cupolas.

At another gray iron session, D. J. Reese of the Bayonne, N. J., research laboratory of International Nickel Co., read a very practical paper on the principles of cupola operation. Beginning with a definition of the cupola melting process, the author went step by step through the various phases of cupola operation and discussed the new developments in each phase.

Cupola Operation

Discussing what was termed the "modern trend" to the use of a front slagging spout, Mr. Reese said he considered this type of slagging as being particularly adaptable to continuous tapping operations, especially on cupolas melting less than five tons per hour. The author also described the experiments that have been carried on from time to time in connection with controlling the moisture content of the blast air. Two piston ring foundries, Mr. Reese said, have been successfully controlling the moisture content of the blast for several years and reports indicate that this practice tends to increase the stability of iron carbide and in this manner lowers the number of castings rejected by the machine shop due to unmachineable hard spots.

Another interesting paper on cupola operation was the one presented by Dr. J. T. MacKenzie and C. K. Donoho, both with the American Cast Iron Pipe Co., Birmingham, on the "Effect of Blast Pressure in Cupola Melting." While the conclusions drawn by the authors from a series of tests made on a 21-in. cupola will destroy the pet theories of many old-time foundrymen, they also cast important light on the subject of varying blast pressures. In making these tests the investigators used both scrap heats and silicon steel heats. The scrap heats showed that carbon pick-up generally decreased with increases in blast pressures, while in the steel heats carbon pick-up was greater in the higher pressure range. As was anticipated, sulphur pick-up generally decreased as the blast pressure increased due to the fact that the faster melting rates prompted by the higher pressures allow less time for contact with the coke. Percentage loss of manganese and silicon showed a slight increase as pressures rose. The authors concluded that in ordinary cupola operation blast pressures may be varied within a wide range to vary the melting rate and that, except for some slight changes in analysis, the melted iron will show no undue variations from normal.

Over 200 Exhibitors

From the standpoint of educational value, the equipment and supplies exhibition was the most impressive ever held by the association. There were approximately 200 exhibitors, displaying equipment ranging from microscopes to complete cleaning rooms.

HYMAN BORNSTEIN

H. S. HERSEY

F. A. LORENZ, JR.

Melters who attended the exhibit halls were visibly impressed by the design of the tuyere system recently developed by Zippler Tuyere Systems Pittsburgh. This system is said to effect considerable economy in coke consumption by virtue of a number of adjustable blocks set in a continuous tuyere belt. These blocks may be moved to any position desired without removing the lining and permit the melter to distribute the blast in any manner he may desire. The mobility of these blocks is said to make it possible to avoid having irregularly burned out sections of the lining.

Grinding wheel exhibits mainly stressed the importance of using the bond and grain best suited to the characteristics of the metal being ground. At the Norton Co.'s booth the new B-E vitrified wheels were shown. These wheels are produced in both resinoid and rubber bond type and are particularly suited to heavy grinding in steel and malleable plants.

The display in the booth of the Abrasive Co., Philadelphia, centered on the new flanged snagging wheel developed by the company and attracted considerable attention. This wheel has a steel flange permanently embedded into the side of the wheel immediately adjacent to and surrounding the center hole. This flange is said to save wear on the mount center and to simplify mounting of the wheel as well as increasing the safety factor.

The Carborundum Co., Perth Amboy, exhibited a new product called Ferrocarbo. The essential ingredient of this product is silicon carbide and it is available in either briquetted or granular form for use as a reducing or deoxidizing agent for iron. It is claimed that the use of Ferrocarbo permits using harder charges with higher percentages of steel and scrap.

New Type Conveyor

A radical departure in conveyor design was exhibited at the booth of the Johns Conveyor Corp., Newark, N. J. This conveyor is in effect a moving rubber pipe line split throughout its length so that it can be pulled apart at any point to receive or discharge material. The two halves fit together by means of double tongues and grooves. When the halves are together so as to make a whole tube the conveyor is run over pulleys and twisted so that the halves are compressed together sealing the tube and preventing leakage. Some of the advantages claimed for this conveyor are that it is not subject to corrosion and resists the attack of most chemicals. Installations are at present handling coal, lime, raw sugar, chemicals, boiler slag and other materials difficult to pump.

The American Foundry Equipment Co., Mishawaka, Ind., had two new machines set up in its booth. One was the new Multi-Tablast designed for cleaning small quantities of small castings. This cleaner is of the table type and has eight 12-in. work tables. The general construction is similar to the larger models. A new small Wheelabrator Tumblast was also shown. The apron conveyor on this machine is constructed of rubber and the abrasive wheel is 12 in. in diameter. The capacity of this Tumblast is 2 cu. ft.

The W. W. Sly Mfg. Co., Cleveland, had set up and operating what is said to be the only continuous blast barrel in America. In operation, the castings are loaded into a conveyor which elevates them to the top of the cleaning compartment. In the cleaning section they are tumbled and blasted by the centrifugal method. After cleaning the castings are automatically discharged. As the discharge interval common to batch type cleaners is eliminated, it is said that substantial cleaning economies can be effected. Another Sly product introduced at the convention was the Centri-Merge wet dust collector. This collector was designed for service where high temperatures, moisture or chemicals are encountered, as, for instance, in shakeout operations.

A semi-portable sand conditioner, called the No. 3 Sanditioner, developed for use with a grab bucket, was on exhibit at the booth of the Jeffery Mfg. Co., Columbus, Ohio. This conditioner may be handled by overhead crane and has a capacity of 30 to 45 tons per hr.

A new large Speedmullor that has three mulling balls in place of two used in smaller mullers was shown in operation at the booth of the Beardsley & Piper Co., Chicago. This company also exhibited a remote-controlled sandslinger that offers very interesting possibilities on large production work. The controlling mechanism is very simple and the sandslinger responds readily to the control.

The exhibits of molding machines illustrated the steady refinement of design and operation that these machines have been undergoing. Hydraulic clamping devices have been made more rugged and positive in action and the time required to perform the various operations incidental to producing a mold has been reduced through the use of automatic devices. The Osborn Mfg. Co., Cleveland, has added a core wire pulling machine to its line and this machine was shown for the first time at the show. This core wire puller consists of a frame on which is mounted a cylinder and a jaw operated by compressed air. A foot pedal controls all operations, leaving the hands free to manipulate the casting. Depressing the pedal causes the jaws to close on the core wire. As soon as the jaws are closed, the piston to which they are attached moves away from the casting extracting the core wire. The makers state that the machine is capable of removing core wire from star gas burners at the rate of 900 per hr.

The newly perfected Oil-Froth wet dust collector was shown in operation at the show by the C. O. Bartlett & Snow Co., Cleveland. This collector employs water and small amounts of oil in the form of fine spray to wet the dust. Oil is said to be most effective in wetting carbon, while water is the most effective agent for wetting silica. A drag conveyor is used to remove sludge accumulations. This collector has been used experimentally for removing dust from cupola gases and the maker states that very favorable results have been obtained in this difficult application.

The Pangborn Corp., Hagerstown, Md., attracted considerable attention with its exhibit of six Rotoblast machines working under actual plant conditions cleaning all types of castings. The largest machine shown is capable of cleaning two tons of castings in ten minutes. A new type of abrasive throwing wheel was also exhibited.

The elements of mechanical cupola charging were clearly shown in the display of the Whiting Corp., Harvey, Ill. This display consisted of small scale models of the corporation's skip hoist charger and wish-bone charger and was very effective in explaining to visiting foundrymen the problems involved in selecting the proper type charger.

The exhibits of pattern making equipment, while small in volume as compared to the cleaning and other production equipment exhibits, made up in interest what was lacking in size.

The booth of the Haskelite Mfg. Corp., Chicago, attracted attention with a display of matchplates constructed of Plymetel. This material consists of several layers of plywood faced with metal. A Plymetel pattern board weighs half as much as an aluminum one, yet is said to have the same strength, endurance and stiffness. The cost is approximately half that of aluminum.

The Sims Matchplate Co., Syracuse, N. Y., had samples of semi-die cast patterns on exhibition. These patterns are cast in composition molds under pressure and are said to be very true to the detail of the master pattern, as well as low in original cost.

The Di-Mold Corp., Dayton, Ohio, demonstrated the method used in producing patterns by the Di-Mold process and exhibited a pattern containing 14 small patterns that was built up from only two master patterns. These patterns are also cast under pressure and regardless of the number of patterns on the plate, only one master is required.

G. A. SEYLER

D. O. THOMAS

° ° °

DIRECTORS elected at the convention for three-year terms are Hyman Bornstein, Deere & Co., Moline, Ill.; H. S. Hersey, C. O. Bartlett & Snow Co., Cleveland; F. A. Lorenz, Jr., American Steel Foundries, Chicago; G. A. Seyler, Lunkenheimer Co., Cincinnati, and D. O. Thomas, Bendix Aviation Corp., South Bend, Ind.

° ° °

. . . . THIS WEEK ON THE

. . . Spreading employment to bring longer season, lower weekly auto output . . . Show space drawing lays rumors of postponed car announcement date . . . Tool and die shop upturn noted . . . "Cycle car" era due to be revived with strong financial backing.

DETROIT.—Materially lower automobile production is scheduled for the remaining weeks of the present models' production year but activity on next year's designs has increased. In terms of employment, this means a continuation of part-time work for production workers—rather than more general layoffs, as had been anticipated—and it means continued work for tool and die shop men.

Laying at rest erroneous reports that the 1939 National Automobile Show would be postponed, it has been announced that drawings for space will be held here June 9 for the exhibit which will open at New York's Grand Central Palace on Nov. 11, as originally planned. Late in April the National Automobile Dealers Association at its convention voted for a return to January announcement date for new models, but the Automobile Manufacturers' Association, show sponsor, did not concur.

Assemblies of passenger cars and trucks declined slightly in numbers last week to a total of 46,810 compared with 47,415 the previous week and 136,438 a year ago, according to estimates of Ward's Automotive Reports. In predicting that the seasonal trend would continue downward, the service said that some factories are making plans to work only two days a week during the next few months to spread employment rather than wind up the year with two or three-month shut-downs. Actual institution of two-day schedules took place in some plants last week.

Car Sales Gained in April

An improvement in passenger car sales in April was recorded in the R. L. Polk & Co. summary of registrations from 33 states, the gain being 9.72 per cent above March, although 50.6 per cent below the corresponding figure for last year. Now it is believed, however, that used car stocks are again higher than they should be and are impeding sales of new cars.

The effort being made to balance production against sales is indicated by the week-to-week fluctuation in the assemblies at various plants. Generally in recent weeks the industry has been reducing field stocks by keeping production on the low side of the sales figure. At the moment, production is approximately six weeks ahead of distributors' selling. Plants of Willys-Overland closed last week with this in mind. Graham has been closed, but resumes production in its body division this week on orders that have accumulated.

Upturn in Tooling Work

An upturn in the tool and die shops serving the industry has been noted, corresponding with a report from the State Department of Labor and Industry that employment in this classification had increased 27 per cent in April as compared with March. Intent on providing more work for its own toolmakers, the General Motors steering gear division at Saginaw has launched a program to make all tools to be used by it in 1939 production. Since 1935 only a small number of tools used in production have been made at Saginaw, the rest being jobbed out.

It is said that special release of designs was obtained from General Motors units to make an early start possible. The tools are being designed now and when the shop begins to get a volume of the work it will have nearly twice the former amount.

The relatively few and minor changes that are being made in next year's cars are not especially attributable to any fear of the future on the part of auto manufacturers. Instead, their reluctance to expend huge sums again is based largely on the fact that the industry has not recovered the heavy investments made for 1937 and 1938 models and this year's production will do little or nothing to help wear down the burden.

Midget Cars to Appear

Machine tool expenditures on a large scale will be made soon, however, since it now appears that there are probably three entirely new light cars ready to make their bows to the driving public. The significance for the auto builders is that this means an attempt to revive the "cycle car" era which brought into prominence about 1912-14 such cars as the Scripps-Booth, Saxon, and others of the glorified motorcycle type that competed with the more bulky cars of the day. Great secrecy surrounds the models now being considered and their financial backing, but Crosley radio interests have finally been definitely linked to one of them, although possible suppliers of equipment are being approached indirectly.

These midget cars apparently will be something like the Austin or Bantam cars of recent years, and are intended to give about 45 miles to the gallon of gasoline. That will put the Willys and new light Ford in an in-between position, to be joined later by a lightweight Chevrolet and Plymouth, perhaps. It is generally known by those in the industry that all the major companies have such light cars developed and ready for actual production with very little more engineering.

Discussion of light cars leads sooner or later to discussion of European practice. Oldsmobile has recently released a study which lists what the American and European buyers get

ASSEMBLY LINE . . . .

By W. F. SHERMAN
Detroit Editor

for the same amount of money. First, Olds compares its $919 two-door six-cylinder sedan with average specifications of four European cars.

	Brake Hp.	Cyl.	Weight	Wheelbase
European average	32.6	4	1900	94.9"
Oldsmobile Six ..	95	6	3275	117.0"

Then the company makes a comparison with the Olds Eight which sells for $1,030.

	Brake Hp.	Cyl.	Weight	Wheelbase
European average	38.7	4	1869	97.5"
Oldsmobile Eight.	110.0	8	3475	124.0"

The European figures are approximately the kind of specifications that will apply to the midget American cars, but costs undoubtedly will be much lower. Even in the last 12 years, manufacturing costs and retail price have been cut sharply in the American auto industry. Pontiac points out that on the basis of car weight alone, not considering performance and durability, the 1938 car purchaser gets $1.62 in value for each dollar he would have spent in 1926.

The 1926 Pontiac, first of the line, included a coupe weighing 2320 lb. and selling for $825, list price. This is at the rate of 35.5c. a lb. The 1938 standard coupe has a curb weight of 3320 lb. At the 1926 pound rate it would list for $1,178.60. Instead, under the pricing policy which prevailed in 1926, the price saving would be $735, an improvement of 62 per cent. Hence the $1.62.

The Increase in Car Values

Besides offering more pounds per dollar, which modern cars do, they have built into them more strength per pound and more rigidity. For example, the Cadillac frame has put on 30 lb. in the last 15 years, but has gained 30 times in rigidness.

This is an important consideration in view of the trend to lighter automobiles because automotive men are agreed that the American public will not accept cars smaller in size than those they are accustomed to. Weight savings must come mostly through clever use of high strength alloys, use of multi-purpose structural parts and the functional use of decorative parts.

When such changes come to pass, the entire process of designing, manufacturing, and assembling, will be changed. With body designing becoming more complex each year, the Ford Motor Co. has established a course in body engineering. There are two classes and each meets twice a week. The majority of the students are draftsmen and die designers. Many of the latter will continue as die men, but it is part of the plan to familiarize them with the body designers' problems in the newer types of bodies.

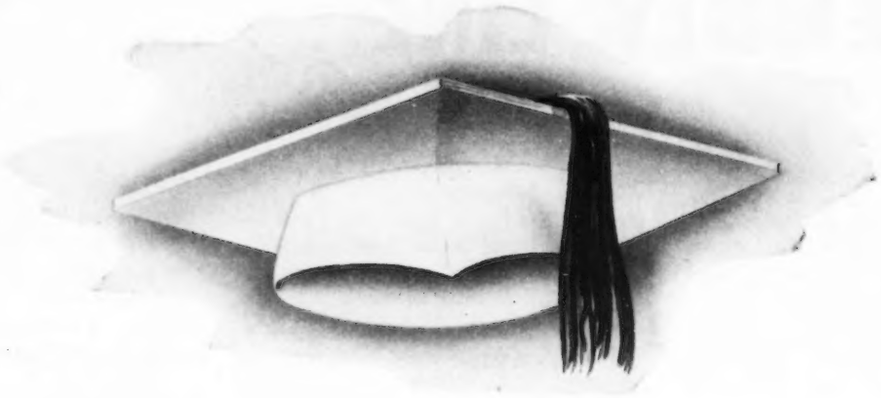
Ford will need more men with this training when the new body plant is completed at the Rouge. It will have a capacity of 7500 bodies a day, compared with Ford's present peak output of about 6400 cars a day. While work on this plant and the consolidated tool and die building was reported held up, releases are now going through for the presses on order.

Ford Starts Coke Oven Plant

Ford has also started sinking piles for the foundations of a new battery of coke ovens to cost more than $1,750,000. Apparently this is part of a program in anticipation of the greater steel capacity which will be available at the Rouge when present construction is completed. If it is true that Ford will more than double his plant's

THE BULL OF THE WOODS — BY J. R. WILLIAMS

NO, I CAN'T PASS ANY OF THEM --- THEY'RE ALL FROM A HALF-THOUSANDTH TO TWO THOUSANDTHS UNDERSIZE ' WE CAN'T USE THAT KIND OF PRODUCT ON GOVERNMENT WORK
DEPT 10 x
I'LL BET THEY'LL NEVER TAKE ANY MORE GOVERNMENT CONTRACTS HERE IF TH' BULL O' TH' WOODS CAN HELP IT..... HE'S PRACTICALLY ELIMINATED AS A BOSS WITH ALL THEM INSPECTORS TELLIN' HIM WHERE TO GET OFF - HIS SOUL AIN'T HIS OWN!
THAT WOULDN'T BE SO BAD IN ITSELF IF TH' GOVERNMENT DIDN'T TAKE A BIG BITE OF HIS PAY FER INCOME TAX, TOO--- THEY'RE TAKIN' HIS PAY TO PAY GUYS TO SASS HIM!
J.R.WILLIAMS
THE STRAIT-JACKET
T. M. REG. U. S. PAT. OFF. COPR. 1938 BY NEA SERVICE, INC.
5-20



THERE'S *Logic*

IN BUYING BARNES-MADE SPRINGS

To protect your purchases of springs and to insure for you a consistently dependable source of supply, these production safeguards are always on the job in the plant of the Wallace Barnes Company:

1. A specialized crew to enter, route and check your order all along the line.
2. Compact production units capable of quick shift-overs in case of emergency, with maximum speed on replacements and hold-ups kept at a minimum.
3. Completely stocked warehouse fed by Barnes' own mill—specializing in high-grade cold rolled spring steel.
4. Experienced trouble-shooters to help unravel the kinks in your spring design or performance.

Check these safeguards for yourself by a visit to the plant...
or by letting us handle your next order

WALLACE BARNES COMPANY

Division of Associated Spring Corporation

BRISTOL, CONNECTICUT

SPRINGMAKERS FOR MORE THAN THREE QUARTERS OF A CENTURY

steel capacity, from 40,000 to 90,000 tons a month, his contribution to solving the used car problem may be a return to the scrapping plan once practiced by the Ford company. Under this plan, $25 was paid for ancient cars within a certain radius of the plant. They were stripped of nonferrous parts, crushed in a huge baler, and used in the open hearths.

Actually, this plan was revived on a small scale for a few weeks early this spring, without the usual fanfare of publicity. It was abandoned at the time when Ford's steel operating rate began to sink to the zero level where it is today.

An attempt to provide adequate braking power for heavily loaded trucks by tapping hot gases from the cylinder head and storing until needed to operate the brakes, may be, in part, the answer to some industrial brake problems. On test on some 30 heavy duty trucks, a device of the Atlas Power Brake Corp., Detroit, is of interest to engineers, automotive and otherwise.

The principal difficulty with other attempts to do the same job previously has been the corrosion and destruction of metal in contact with the burning flame of the exhaust gas. In this case, however, the design smothers the flame just after it is tapped from the engine. The gas then is carried through an expansion tank and stored cold for use. Only about one-sixteenth of a horsepower is taken from the ordinary truck engine, it is claimed.

Iron Quality Problem of the Steel Industry

(CONTINUED FROM PAGE 45)

phur content of the iron, although the latter values were far less than those of the earlier investigations. Presence of ash is said to be objectionable in another way. Formation of alkali cyanides in the tuyere zone can only proceed if some alkali metals are present in the burden. These are introduced almost entirely in the coke ash.

Composition of limestone[28] is important as affecting the desulphurizing power of slag. Presence of magnesium oxide is somewhat deleterious to desulphurizing if the slag is acid in composition, but is, however, decidedly favorable in more basic slags. Also the presence of magnesium oxide in some instances reduces slag viscosity, which in its turn reduces its desulphurizing power within certain limits.

The use of scrap in the burden, although not a universal practice, constitutes a possible source of trouble through the introduction of unwanted residual metals in the iron.

The rate of driving may be controlled by varying the blast, but it is also dependent on the properties of the coke and the proportioning of the burden. From the production standpoint it has usually been considered that the faster the driving the more economical the operation, but investigation[29] of slack-wind operation has shown that considerably less than capacity operation may be economically carried on.

A high rate of driving need not adversely affect the quality of the iron if the furnace is properly burdened, but a rate of driving which brings unreduced ore into the tuyere zone and hearth is detrimental to quality. In the first place, oxide content of the iron will be raised[4, 9] and in the second place, formation of alkali cyanides and absorption of nitrogen by the iron will be greatly increased[7]. If the rate of driving exceeds the rate of combustion of the coke, the furnace will, of course, be cooled down and the sulphur will rise excessively. Irregular driving is detrimental to iron quality, as is every other factor adversely affecting the regularity of the furnace operation. A steep temperature gradient[30] during a blowing period between casts, which may be caused by erratic driving, is productive of variations not only in silicon and sulphur content, but also in carbon content of the iron.

In considering temperature in the blast furnace it is necessary to know the point at which the temperature is determined. The interior of the blast furnace covers a wide range of temperature, but the points of greatest interest are the fusion zone and the hearth. Unfortunately, it is extremely difficult to measure accurately these higher temperatures within the furnace. Consequently the temperature of the iron in the runner is measured. Fig. 2 indicates that the temperature within the blast furnace hearth, as represented by the temperature of the iron in the runner, has an important effect on the composition of the iron produced. That figure also shows the degree of temperature variation to be expected from varying different elements.

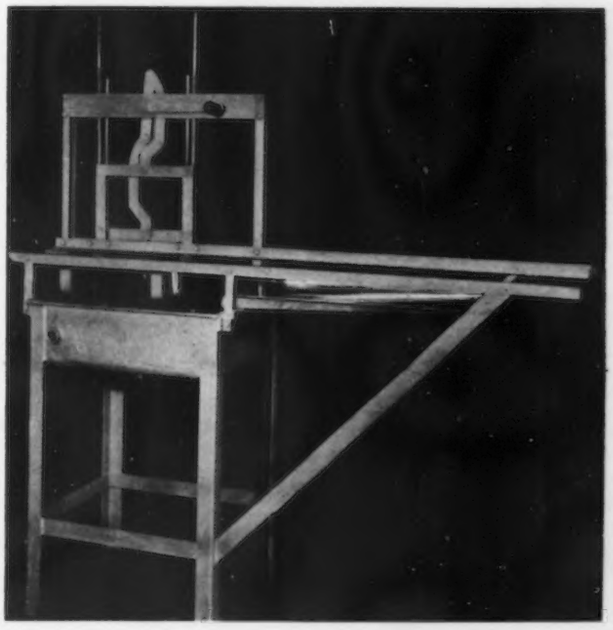
o o o

Ed. Note: — In the concluding portion of this article next week, the authors will describe the effects of variable iron quality on steel quality, and will present tables showing the effect of residual sulphur and of manganese in the iron on the surface of the steel.

o o o

THIS machine is used for putting the chocolate covering on popsicles. It is made entirely of stainless steel and conforms in all respects to the sanitary code of the health department. All parts are easily removable, without the use of special tools, for cleaning purposes. It was designed, developed and manufactured by the Thomas S. Gassner Co., Inc., Philadelphia, which specialize principally in stainless steel fabrication.

o o o



THIS WEEK IN WASHINGTON

. . . Petition for setting aside of Pittsburgh-plus order throws basing point controversy into courts . . . Growing obstacles face RFC equipment loan bill as workers threaten strike . . . Department of Justice plans publicity on anti-trust suits to guide business.

By L. W. MOFFETT
Resident Washington Editor
The Iron Age

° ° °

WASHINGTON.—Thrown into the courts after lying quiescent for 14 years, the petition of the United States Steel Corp. to set aside the "Pittsburgh-plus" order issued by the Federal Trade Commission on July 21, 1924, for the first time brings the Government and industry to grips by litigation over the basing point system of quoting prices.

Filed with the United Circuit Court of Appeals in Philadelphia last Wednesday the petition was prompted by the Wheeler-Lea Act of March 21, this year, which retroactively makes final after 60 days (May 21) all FTC orders except those on which appeals to United States Circuit Courts have been taken.

The elaborate cease and desist order directed against the United States Steel Corp. and its subsidiaries in essence demanded f.o.b. mill quotations on rolled steel products. The order was issued under the original Federal Trade Commission and Clayton Acts. While maintaining that the FTC had no authority to issue the order, the United States Steel Corp. made no appeal but announced that it would comply with the order "so far as possible."

Up to Circuit Court

Enforcement of the order would compel f.o.b. mill quotation of prices with accompanying abandonment of the basing point system which provides for delivered price quotation.

The circuit court of appeals in Philadelphia will determine whether or not the Pittsburgh-plus order shall be set aside after which the case may be taken to the Supreme Court.

It has been a highly controversial subject ever since the Pittsburgh-plus order was issued and currently is particularly brisk in view of moves by the Government on two fronts to compel f.o.b. mill quotations. One attack is through an FTC complaint against the cement industry for its use of the multiple basing point system. The other, which appears to have been defeated, temporarily at least, is the Treasury Department Procurement Division requiring that bids to supply cement be based on either a mill or storage plant basis. Should the Government feel that it achieved success through the Procurement Division plan it may next make a like demand on the steel industry. Obviously an FTC cease and desist order in the cement case will be followed by similar action against other industries using the basing point system unless by court determination it is told it has no authority under either the original FTC and Clayton Acts, or amendments to them, to promulgate such orders.

May Form Policy

It is held to be quite conceivable that the outcome of the pending United States Steel Corp.-FTC court proceedings may shape the course of the Government through the FTC or other units with respect to the basing point system. However, the FTC contends, as shown by its pending complaint against the cement industry, that its authority to demand f.o.b. mill quotation has been reinforced by the Robinson-Patman anti-price discrimination act of 1936. Hence, even though the commission should be defeated in the steel corporation case it may still fall back on a law enacted since issuance of the cease and desist order, as the commission is now doing, to attack the basing point system.

Meanwhile, the United States Steel Corp. and its subsidiaries—American Bridge Co., Carnegie-Illinois Steel Corp., American Steel & Wire Co., and Tennessee Coal, Iron & Railroad Co.— have been assured protection against penalties for non-compliance with the cease and desist order pending court action on the appeal. In denying the petition to set aside the order, the Circuit Court through Judges Joseph Buffington and J. Warren Davis said they felt that the steel companies were fully protected by the appeal, which was filed before the Wheeler-Lea Act provision became effective. Assurance also was given by FTC counsel that the commission would take no further action until the court ruled.

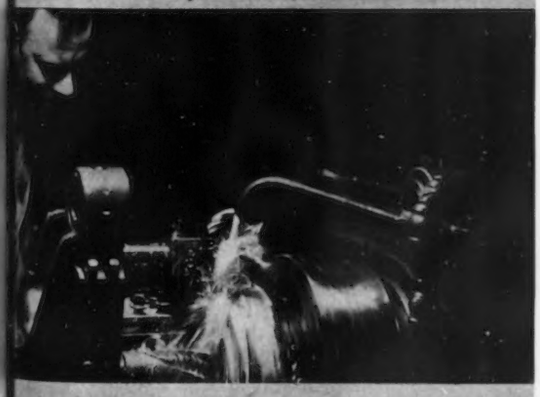
Long Proceedings Seen

The proceedings promise to be prolonged. The Circuit Court ordered that the bulky transcript in the Pittsburgh-plus be certified to it for review. The voluminous character of the transcript can be seen from the fact that it consists of about 20,000 pages of testimony and approximately an equal number of exhibits, to say nothing of the numerous and thick briefs.

United States Steel contends the order was based on practices and conditions as they existed prior to 1924, not applicable to present-day conditions. It was declared that the enforcement should not be made under the facts and conditions as they now exist. The petition pointed out that although the FTC has never taken any court action to enforce the order, the order has never been actually re-

Pinion Gear
TION—Drill, turn,
amber, cut-off.
E-W & S 3-A
AL—S.A.E. 3150
SUNOCO 1 part, water 15 parts

SPINDLE SPEED—110 RPM
CUTTING SPEED—75 RPM
FEED—.012" per rev.
DEPTH OF CUT—2"



Gear Blank
ONS—Turn, drill,
E-W&S2-A Lathe
SPEED—31 RPM
SUNOCO 1 part, water 15 parts

MATERIAL—S.A.E. 3250
Forging
CUTTING SPEED—75 RPM
FEED—.024" per rev.
DEPTH OF CUT—1"

PREFERRED BY SKILLED MECHANIC

The skilled mechanic soon observes that SUNOCO represents an advance in all those qualities essential in a cutting lubricant to provide ease of operation and fast accurate production.

— — bacteriological tests prove that SUNOCO is hygienic and will not permit the development of pus-forming bacteria or pathogens which cause skin inflammation.

— — years of actual performance tests proved SUNOCO's lubricating and high heat absorbing qualities make possible increased production, reduced "time out" for resharpenings and decreased rejects.

These two outstanding features alone have made SUNOCO preferred by skilled mechanics throughout the metal working industry.

SUN OIL COMPANY, PHILADELPHIA, PA., U.S.A.

Offices and Warehouses in more than 100 cities

Subsidiary Companies:

Sun Oil Co., Ltd., Montreal, Toronto • British Sun Oil Co., Ltd., London, England

PHOTOS COURTESY OF WARNER & SWASEY

SUNOCO

EMULSIFYING

CUTTING OIL

Ever-increasing uses for SUPERIOR Stainless Steel present new and profitable markets for your products.
Avail yourself of our Engineering Service without obligation.

SUPERIOR STEEL CORPORATION

Executive Offices
GRANT BLDG. PITTSBURGH, PA.
General Offices and Works
CARNEGIE, PA.

scinded. Had the steel corporation not filed its petition the order, under the Wheeler-Lea Act, would have become final last Saturday.

Has no Validity

"The order has been abandoned by the commission," said the petition, presented by Nathan L. Miller, New York, and William Beye, Pittsburgh, corporation attorneys, "and no longer has any validity. It has never been practical for your petitioners or others similarly situated to comply and your petitioners have not complied with the provisions of said order. The fact of such non-compliance has at all times been known to the commission. Despite such knowledge of non-compliance, the commission has never taken any action for the enforcement of said order.

"The enforcement of the order at this time upon the record made prior to the year 1924, would, in view of changed conditions, deprive your petitioners of their right to a fair hearing."

U. S. Plans Anti-Trust Suit Publicity to Guide Business

WASHINGTON. — Embarking on a new policy of giving publicity to contemplated anti-trust suits as a guide to business and industry, Attorney General Cummings last week outlined a Justice Department plan to issue a series of public statements on the Administration's prosecution policy.

Describing the program as tentative and experimental, Mr. Cummings said it was a direct outgrowth of a discussion held in April with a group of trade paper editors plus the frequently heard complaint that business is unable to learn with any degree of definiteness just what can and cannot be done under the present anti-monopoly statutes.

The Attorney General is known to feel that it is next to impossible for his anti-trust division to determine in advance whether a proposed arrangement is legal or illegal but he is apparently willing to go along with the new program and give it a trial. Almost without exception every Attorney General in the history of the department has declined to give out advance information from which might have come a clue as to what was considered right or wrong, and the action of the Justice Department in adopting this new procedure is expected to receive favorable acceptance from all quarters.

Form of Statements

Future statements, Mr. Cummings told a press conference, will follow in general a standard form indicating:

(1) The conditions which the department believes to exist in the particular industry which create monopolistic control or restraint of trade; (2) reasons why a particular procedure is followed, whether a civil suit, consent decree, criminal prosecution, acceptance of pleas of nolo contendere, or dismissal of the proceedings; and (3) the economic result expected from the action.

In this way, the department believes its announcements will serve as a key to industries seeking information on probable action under similar circumstances, will aid the department in formulating a consistent policy of anti-trust law enforcement, will constitute a warning to those engaged in similar illegal practices, and will focus Congressional attention on anti-monopoly interpretations at a time when anti-trust revision is up for consideration.

Cases to Grand Jury

The department has promised that statements on prosecution policy will not discuss the guilt or innocence of particular defendants and will not waive the presumption of innocence in a criminal case or the advantage of the burden of proof enjoyed in civil cases. But the statement will be directed toward outlining the reason for departmental action, it was explained.

Alleged violations of the anti-trust laws, which were referred to a Milwaukee grand jury last year against the Ford Motor Co., the Chrysler Corp., and General Motors and their respective finance companies have been re-instituted by the Justice Department and the announcement marked the first statement of policy under the new procedure. The case was dismissed last December by Judge Ferdi-

nand Geiger, who charged the department with "impropriety" in negotiating for a consent decree while a grand jury was sitting in the case. The specific charge is that the companies allegedly dictate a particular finance company plan—that of their affiliated finance company.

The case also was the first major anti-trust move to be made by the Justice Department since the anti-trust division was turned over to the new Assistant Attorney General, Thurman Arnold, former Yale law professor and author of the "Folklore of Capitalism."

Roosevelt Asks Data On Business Reports

WASHINGTON. — Five years after its creation as an agency to improve the Government's statistical services and eliminate unnecessary duplication, the Central Statistical Board has been asked by President Roosevelt to report on the increasing number of reports required of business and industry by various Government departments.

The President told a press conference that there was no particular reason at this time for requesting the survey, that it was just something that had to be done. Complaints from various business groups have reached Washington recently because of the growing number of bureaus and Government departments flooding the business world with questionnaires, many of them duplications.

Senate Group Backs Walsh Measure

WASHINGTON.—The Senate Committee on Education and Labor recommended to the Senate last week that it pass the pending Walsh bill designed to broaden the scope and tighten the enforcement of the Walsh-Healey Government contract law.

Effective since 1936, the law administered by the Labor Department sets up minimum working standards to which companies contracting with the Government must adhere. The proposed revision would include under the provisions of the law, all contracts in excess of $2,000 whereas the present limit is $10,000, would cover for the first time shipbuilding and service contracts, and would require contractors to procure certificates from sub-contractors agreeing to comply with the labor standards.

Your

OPERATOR—TREASURER—PRODUCTION MANAGER—SALES MANAGER..Each has his

Reason for Preferring a Warner & Swasey

Your Operator will like a modern Warner & Swasey Turret Lathe because with it he can increase his production and so make himself more valuable to you—and do it with far less effort, less fatigue.

Your Treasurer will prefer a Warner & Swasey because it cuts turning costs as much as 50% and earns for the average user a 20% net profit on the investment.

Your Production Manager will like a Warner & Swasey because it reduces scrap loss and down time, helps him maintain his production schedules easily, cuts costs no matter how large or small his current production, and makes a hit with his operators

Your Sales Manager will welcome a Warner & Swasey because it can often improve your product and lower its cost.

In fact a modern Warner & Swasey earns a profit for everyone connected with its operation. A W & S field engineer will be glad to tell you exactly how large that profit would be in your plant. Write

You can turn it better, faster, for less—with a Warner & Swasey

WARNER & SWASEY Turret Lathes *Cleveland*

Rail Equipment Loan Measure Is Recommitted

WASHINGTON.—Prospects for passage of the RFC-railroad equipment loan bill diminished considerably last week after the Senate voted to recommit the measure to the Senate Banking Committee for the purpose of considering the prohibition of loans to carriers inaugurating wage reductions.

Jones Joins in Opposition

The motion to recommit followed the action of several senators, including the bill's two sponsors, Wagner and Truman, and Chairman Wheeler of the Senate Interstate Commerce Committee, in assailing the railroads for proposing wage reductions at a time when financial assistance from the government was pending. Jesse H. Jones, RFC chairman, joined them in opposing the legislation under the circumstances.

On the House side, the Goldsborough bill which had been reported favorably by the House Banking and Currency Committee was laid aside temporarily in view of the Senate action. It is a companion measure to the Wagner bill.

The railroads, little disturbed by events plan to cut wages 15 per cent July 1. Reports that the carriers would not have availed themselves of the financial assistance through RFC loans even if the bill passed tended to minimize the importance of the Senate action.

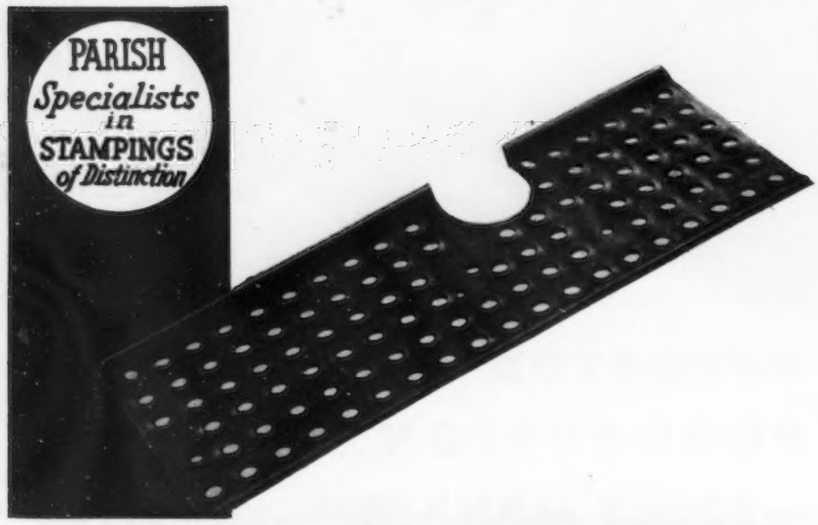
Nevertheless, the railroad labor unions announced in Washington that they would strike if and when the carriers put the wage reduction into effect, and charged the railroads had acted in bad faith in proposing reductions while union representatives were cooperating to find a way out of present difficulties.

FTC Rules Against Chicago Foundry

WASHINGTON.—The Federal Trade Commission has issued an order requiring Central Pattern & Foundry Co., 3737 South Sacramento Avenue, Chicago, to cease and desist from certain alleged misrepresentations in the sale of aluminum castings. The company is directed to stop using the expression "only new ingot metals" or any other expression or device of similar import and meaning to describe such products or the metal from which they are made, unless such castings are manufactured wholly from primary or virgin aluminum, the FTC said.

War Materials Bill May Soon Be Passed

WASHINGTON.—The pending Thomas bill, authorizing the Army and Navy to procure and stock $75,000,000 worth of materials considered war-time essentials, is reported to be the result of a four-year study and the product of experts from five Government departments, and may be pushed for passage at this session. Senator Thomas, Democrat, of Utah, forecasts that there is a chance for favorable action before adjournment.



Safety for the Brakemen

Neither the gauge, size nor specifications of a stamping presents any obstacle to Parish. Skill, experience and equipment combine to make difficult stampings comparatively easy in Parish shops.

This non-skid brake step for box cars is 1/4" thick x 30" long x 10" wide. The flange is 1". Embossing around the holes makes the step non-skid. Another of the many types of stampings produced by Parish for many industries.

Have you a problem that could be worked out in pressed metal? Our engineers will do it for you.

PARISH PRESSED STEEL CO., Reading, Pa.

PACIFIC COAST REPRESENTATIVE
F. Somers Peterson Co., 57 California St., San Francisco, Calif.

Roosevelt Caused Depression But Won't Change, Weir Finds

A BUSINESS recovery leading to a solidly-founded prosperity, with "men wanted" signs hanging from factory gates, "would start within four to six months" if the Roosevelt Administration changed its policies and encouraged private enterprise, Ernest T. Weir, National Steel Corp. board chairman, said last week.

However, he told the annual West Virginia Chamber of Commerce meeting at Charleston, W. Va., the "hopes of an Administration change of heart" aroused by Presidential conferences with business men had been killed by Roosevelt's subsequent statements and actions.

Offers a Program

Mr. Weir, who has attended some White House conferences, placed responsibility for the depression squarely on the New Deal Administration, declared that the chief hope for reconstruction rests with Congress and the people, and offered a many-pointed recovery program. The Government must, he said:

1—"Restore confidence by an unqualified pledge to retain unaltered the principles and structure of the American systems of business and of Government.

2—"Declare a permanent policy with regard to basic economic controls.

3—"Amend tax laws to eliminate punitive and crippling provisions.

4—"Amend the labor laws so that they shall be fair and apply with equal force to the employer, all employees and all labor organizations.

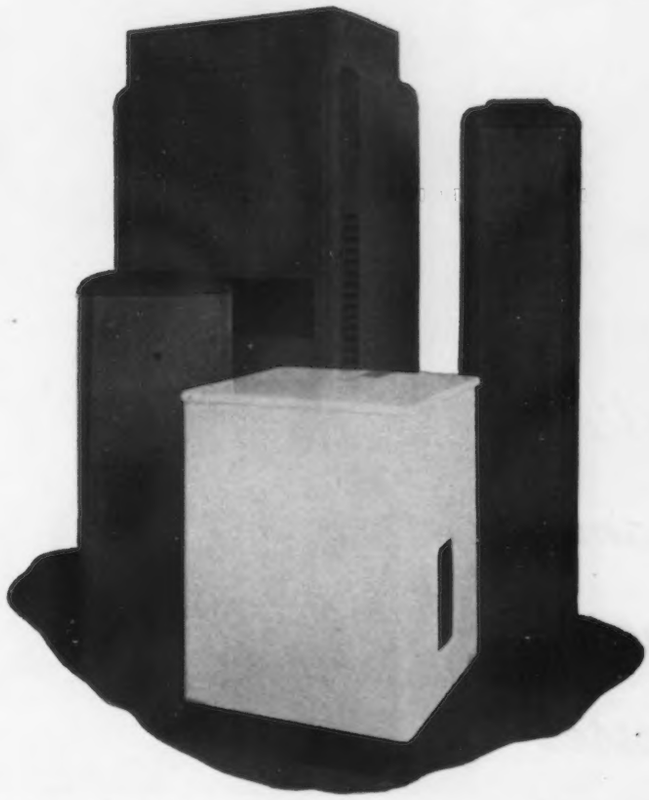
5—"Send the Corcorans, the Cohens (Roosevelt's advisers) and their kind back where they came from. Cease attacks on business. Provide a leadership under which all people can unite. Make this program clear and then stick to it.

Founded On Ignorance

"Of the conferences (business and Roosevelt) of which I have personal knowledge, I can say that there was no lack of suggestions of sound, practical methods to stimulate business activity," Mr. Weir said. "And it was revealed in these conferences that much of the Administration's attitude toward business and many of its plans affecting business were based on a mass of misinformation and a lack of practical understanding rather than on a fund of knowledge.

The steel executive declared that "the country is being starved to death economically by a constant contraction in the volume of business which, unquestionably, is the result of the policies which this Administration has expressed and put into operation over the last five years.

"No longer do we need to speculate on the consequences of the Administration's theories," he said. "Today we have the facts. Under the principle of free enterprise, we had a history of growth and development for a century and a half. In contrast, we now have the results of the new methods



YORK *Stampings*

Have that distinctive beauty that is the result of a thorough knowledge of stamping practice. No matter how easy, difficult, or unusual your specifications may be, the same painstaking application to the job at hand assures you a perfectly finished product, not only salable, but having that certain something that makes it *easier* to sell.

YORK offers the latest type facilities for producing light or deep drawn stampings of all kinds, such as, automobile fenders, sheet metal cabinets for hot water heaters and water coolers, air-conditioning apparatus, gasoline pumps, boiler casings, etc.

Also, at your disposal, is a complete service on tool and die design with stampings furnished either plain or finished.

Write today for an estimate on your requirements.

YORK CORRUGATING CO.
YORK, PENNSYLVANIA

and new theories of the past five years. Which has been of most benefit to the country?"

Message Found Evasive

Criticizing the spending and lending proposals made in the President's message last month to Congress, Mr. Weir said:

"In my opinion this message was evasive, defensive, and thoroughly lacking in practical understanding of what the country needs. It betrayed a desire to save face rather than face facts, admit errors and do what must be done to bring recovery.

"Mr. Roosevelt admits that the billions he wants the Government to spend will be only a drop in the bucket as compared with normal private spending but he expects those billions to act as a trigger which will set off an entire train of business activity and also bring the savings of the investors out of hiding. How hopeless! Those four billions in I.O.U.'s will have no more effect than fool's gold unless the Administration allows business to become self-generating."

Ajax Solid Frame Forging Presses

For Most Accurate Forging and Coining

Outstanding features of Ajax Upsetting Forging Machines have been built into this full line of high speed, heavy duty Forging and Coining Presses.

- ONE-PIECE, SOLID STEEL FRAME, of ample cross section for extremely low stresses and negligible elongation at full rated tonnage, results in close tolerance forgings.
- SOLID SLEEVE CRANKSHAFT BEARINGS in integral frame housings provide rigid support for the full-eccentric crankshaft and prevent deflection of this important member.
- REAR EXTENSION GUIDED SLIDE has the advantages of great guided length and perfect die match at the same time affords full accessibility to the pitman.
- ROLLED STEEL PITMAN, flame-cut from special analysis rolled billet with wrist pin augmented by thrust shoe bearing for outside pitman end.
- AJAX PATENTED DIRECT AIR OPERATED FRICTION CLUTCH gives instantaneous treadle response and smooth cushioned starting action at operating speed heretofore regarded as impossible.

IN CAPACITIES FROM 500 TO 2000 TONS

THE AJAX MANUFACTURING COMPANY

EUCLID BRANCH P. O. CLEVELAND

621 MARQUETTE BLDG., CHICAGO • 201 DEWART BLDG., NEW LONDON

NLRB Certifies AFL at Beloit Iron Works

WASHINGTON. — The NLRB has recognized the AFL's pattern makers union as collective bargaining agent for pattern makers at the Beloit (Wis.) Iron Works and has ordered the dissolution of the Beloit Iron Works Employees Association, and the reinstatement with back pay of four former employees allegedly discharged. All four are members of the AFL's International Association of Machinists, the other craft union representing the bulk of workers at the factory.

Hook Asks Study on French Trade Pact

WASHINGTON. — Charles R. Hook, president of the American Rolling Mill Co., has written to Secretary of State Hull on behalf of the National Association of Manufacturers, of which he is president, requesting a study of possible modification of the Franco-American Reciprocal trade agreement in view of the recent devaluation of the French franc.

Recovers Oil from Chips By Washing and Floation

AT the River Rouge plant of the Ford Motor Co., chip conveyors are widely used to facilitate chip salvage and coolant oil recovery. Chips are crushed and used in the blast furnace or sold to the trade as short shovel turnings, but the oil is first removed from them. The chip conveyor passes through a tank where they are washed in hot water as they move along. The oil floats off them and is separated from the water in a reservoir, from which the oil on top overflows into a second reservoir where further separation is assured. The salvaged oil is returned to the system which circulates it to the machines, but not before it is heated to a germ-killing temperature. Approximately 17 gal. of oil is salvaged from every ton of turnings.

...OBITUARY...

JAMES H. LOCKHART died at his home in Pittsburgh on May 16, aged 74 years. He was a director and vice-president of the Lockhart Iron & Steel Co., and a director of the Alpha Portland Cement Co., United Engineering & Foundry Co., Mellon National Bank, Union Trust Co. and Union Savings Bank, all of Pittsburgh.

❖ ❖ ❖

JOSEPH B. STRAUSS, consulting engineer and well known bridge designer, died last week in Los Angeles, aged 68 years. During his career, Mr. Strauss designed some 500 bridges, including the Golden Gate bridge and the George Washington bridge, America's two longest spans. Mr. Strauss was a graduate of the University of Cincinnati and one of his first jobs was that of estimator and designer for the Lassig Bridge & Iron Co., then in Chicago. From 1902 to 1904 he headed his own firm of bridge engineers in Chicago, after which he became a consulting engineer.

❖ ❖ ❖

HARRY LEE WILLIAMS, who supervised the erection of the American Bridge Co. plant at Gary, Ind., died in Gary last week, aged 66 years. Mr. Williams was superintendent of construction for the Eastern division of the bridge company when he was sent to Gary, to supervise the plant erection there. He also managed the building of No. 1 open-hearth furnace at the Gary works of Carnegie-Illinois Steel Corp. Mr. Williams retired from the bridge company in 1926.

❖ ❖ ❖

OSCAR W. JOHNSON, general plant superintendent of Morgan Construction Co., Worcester, Mass., died suddenly on May 9. He had been associated with the company for 40 years.

❖ ❖ ❖

LEON F. DELARGEY, purchasing agent, Eaton Mfg. Co., Cleveland, died May 19 in a Cleveland Hospital. He was 50 years old.

❖ ❖ ❖

HERBERT M. RAMP, formerly foundry superintendent of the LaPorte, Ind., works of the Allis-Chalmers Mfg. Co., died suddenly at his home in that city on April 23, aged 69 years. Prior to going to LaPorte 15 years ago to become superintendent of the Advance-Rumely Co., he was superintendent of foundries for the General Electric Co. and for the American Locomotive Co.

❖ ❖ ❖

CHARLES STUPKA, traffic manager, United Screw & Bolt Corp., Cleveland, died May 17, aged 45 years.

FRANK E. DROESE, assistant chief chemist at Corrigan, McKinney works of Republic Steel Corp., Cleveland, died May 16 in Cleveland.

❖ ❖ ❖

WILLIAM E. STAFFORD, chief clerk at the Joliet works of American Steel & Wire Co., died of a heart attack May 18, aged 53 years. He had been identified with the company for 33 years.

A-E-CO
HELE-SHAW
Fluid
POWER
PUMPS, MOTORS & TRANSMISSIONS

Hele-Shaw Fluid Power is as responsive as the HUMAN HEART

Hele-Shaw Fluid Power is oil under pressure. Like the human heart, it responds immediately to changing demands. It works constantly—quickly varying itself to all required conditions of speed, pressure, and direction without lag. No operating time is wasted in adjustment. It increases production.

This is *one* reason why so many machine designers, builders, and buyers are specifying Hele-Shaw Fluid Power for obtaining *controlled* linear or rotary motion.

But there are other equally important advantages. Hele-Shaw Fluid Power offers wide flexibility of location. It sustains its pressures with a minimum loss of energy. Pumps, motors and transmissions are self-lubricating.

Write us for complete details. Ask us to show you how Hele-Shaw Fluid Power can be advantageously applied to the machinery you design, build, or buy. Specify Hele-Shaw.

A-E-CO Hele-Shaw FLUID POWER

OTHER A-E-CO PRODUCTS: Lo-Hed Hoists, Taylor Stoker Units, Marine Deck Auxiliaries.

AMERICAN ENGINEERING COMPANY

2410 ARAMINGO AVENUE, PHILADELPHIA, PA.

. . . THE NEWS IN BRIEF . . .

Optimism is keynote of the American Foundrymen's Association convention held in Cleveland.
—Page 52

Spreading employment to bring longer season, lower weekly auto output.
—Page 56

"Cycle car" era due to be revived with strong financial backing.
—Page 56

Department of Justice plans publicity on anti-trust suits to guide business.
—Page 60

Growing obstacles face RFC equipment loan bill as workers threaten strike.
—Page 60

Petition for setting aside of Pittsburgh-plus order throws basing point controversy into courts.
—Page 62

President asks data on business reports requested by bureaus and government departments.
—Page 63

The Senate Committee on Education and Labor backs Walsh measure.
—Page 63

Rail equipment loan measure is recommitted.
—Page 64

FTC rules against Central Pattern & Foundry Co.
—Page 64

Roosevelt caused depression but won't change, E. T. Weir finds.
—Page 65

NLRB certifies AFL at Beloit Iron Works.
—Page 66

Charles R. Hook, president American Rolling Mill Co., asks study on French trade pact.
—Page 66

Recovers oil from chips by washing and flotation.
—Page 66

Steel town voters sweep CIO candidates to defeat in Pennsylvania.
—Page 70

Third machine tool electrification forum held by Westinghouse Electric & Mfg. Co.
—Page 71

Franklin Institute has Ajax exhibit.
—Page 77

Bethlehem Steel Corp. to take over United Shipyards, Inc.
—Page 77

Westinghouse salaries reduced 10 per cent.
—Page 77

S.A.E. summer meeting at White Sulphur Springs, June 12.
—Page 77

U. S. worker on job fewer hours for food.
—Page 77

Workers increase with new sheet mills, Institute says.
—Page 78

Book on aluminum by Douglas B. Hobbs now available.
—Page 79

Austin-Hastings plans machine tool show.
—Page 79

Develops dry blanket for molten metal baths.
—Page 79

Bethlehem cancels stock-buying plan.
—Page 80

Stainless Steel, Inc., is formed at Chicago.
—Page 80

General Engineering & Mfg. Corp. purchases plant in Newark.
—Page 80

Upswing by mid-August seen by purchasing agents' head.
—Page 81

Heavy scrap exports ruinous, Wolcott, of Lukens Steel, says.
—Page 82

Large sheet mill to be built in Australia.
—Page 83

Westinghouse to spend $12,000,000 this year.
—Page 84

United States labor is paid more and can buy more, survey shows.
—Page 85

Flat rolled steel reclassified; base prices and extras adjusted.
—Page 94

Machine tool buyers report a falling off in orders, but signs of new buying activity are multiplying.
—Page 104

SECTIONS INDEX

Obituary	67
Personals	73
Fabricated Steel	103
Steel Ingot Production	87
Summary of the Week	89
Comparison of Prices	89
Pittsburgh Market	90
Chicago Market	91
Cleveland Market	93
New York Market	96
Philadelphia Market	97
Non-ferrous Market	97
Scrap Market and Prices	98
Finished Iron & Steel	100-101
Pig Iron & Raw Material Prices	102
Machine Tool Activity	104
Plant Expansion & Equipment	105

CONVENTIONS

June 12 to 17—Society of Automotive Engineers, White Sulphur Springs, W. Va.

June 13 to 15—American Electro-Platers' Association, Milwaukee.

June 20 to 24—American Society Mechanical Engineers, St. Louis.

June 27 to July 1—American Society for Testing Materials, Atlantic City, N. J.

Sept. 26 to 30—Association of Iron and Steel Engineers, Cleveland.

Oct. 10 to 14—American Institute of Steel Construction, French Lick Springs, Ind.

Oct. 17 to 21—National Metals Congress, Detroit.

Familiar to those active in the agricultural field are these four streamlined pressed steel radiator shells produced by Transue.
FOUR OF A KIND
...AND HARD TO BEAT!
One success producing a tractor radiator shell might have been good fortune . . . Two might have been coincidence . . . But four proves that Transue designers and Transue Stampings have thoroughly convinced one of our greatest major industries.
Transue invites any engineer, purchasing agent or executive interested in the possibilities of pressed steel to "call our hand" for more information.
TRANSUE & WILLIAMS
ALLIANCE, OHIO
DESIGNERS & MAKERS OF DEEP DRAWN
STAMPINGS
Sales Offices: New York · Philadelphia · Chicago · Indianapolis · Detroit · Cleveland

Steel Town Voters Sweep CIO Candidates to Defeat

By T. C. CAMPBELL
Iron Age Pittsburgh Editor

o o o

PITTSBURGH.—Critics of John L. Lewis this week were analyzing the CIO defeat in last week's primary election in this state to determine how the results may affect the future of the SWOC, his steel unionizing agency.

While Philip Murray, SWOC chairman, described the Pennsylvania vote as a "remarkable victory," for the CIO Allegheny county and many western Pennsylvania communities considered CIO union strongholds had either turned down the Lewis candidates or had given them unexpectedly weak support. The local as well as the statewide picture is one of defeat for Lewis.

Only two of 38 local candidates for office indorsed by the CIO-SWOC forces in Allegheny county were nominated while Democrats in the steel town of Homestead voted almost two to one against Lewis' candidate for governor, Thomas Kennedy.

A leading SWOC casualty was Philip J. Clowes, SWOC sub-regional director who helped supervise the Johnstown steel strike of last summer. Mr. Clowes, who issued pre-election claims of support from 42,000 steel, glass, aluminum and coal mine workers in the Allegheny river valley, received less than 6000 votes. Another SWOC sub-regional director badly defeated in the primary was John B. Dutchman, of Pittsburgh, who ran eighth in a field of 11 candidates for the state legislature.

Green's Candidates Win

In an election which saw every CIO candidate for statewide office defeated, the Pennsylvania Democrats elected every candidate for such offices indorsed by William Green's American Federation of Labor. Said Mr. Green:

"Even the mining sections showed in the returns that the mine workers and their friends asserted their independence when they were accorded an opportunity to vote by secret ballot. It has now become abundantly clear that no candiate who bears the CIO brand can be elected to high office in this country. The primaries proved that the CIO is a political liability, not a political power.

Hard Coal Miners Revolt

Mr. Lewis declined to comment immediately after the election returns at Washington while analysts found many surprise results in the election. It was noted that Mr. Kennedy, CIO man and secretary of the United Mine Workers (which Lewis heads as president and which largely financed the steel union membership drive) was defeated in many mining communities, including all five anthracite coal counties of eastern Pennsylvania.

Some of the nearby industrial communities in which Democrats rejected Kennedy and other CIO candidates despite their boasted union strength are:

Homestead—Charles Alvin Jones, the Democratic nominee for this state's governor, received 3013 votes against 1504 for Kennedy.

Etna—Jones received 886 votes against 537 for Kennedy.

Wilmerding—281 votes for Jones against 245 for Kennedy.

West Homestead—Jones, 351, and Kennedy, 298.

Blawnox—Jones, 210, and Kennedy, 157.

Braddock—Jones, 1639, and Kennedy, 1626.

Castle Shannon, Jones, 203, Kennedy, 178.

Allegheny county, scene of one of the most intensive labor union drives in American industry during the last two years, voted approximately 115,000 for Mr. Jones against about 82,000 for Kennedy, candidate of the CIO unions and of Democratic National Chairman James A. Farley.

Leads In Soft Coal Field

The soft coal field counties in western Pennsylvania, including many captive mines, furnished much less support for the CIO man than anticipated and unofficial returns showed:

Fayette county—Kennedy, 13,867; Jones, 9177.

Greene county—Kennedy, 2419; Jones, 2369.

Washington county — Kennedy, 15,340; Jones, 7044.

Westmoreland county — Kennedy, 21,769; Jones, 10,389.

And Mercer county, where a National Labor Relations Board election a year ago in Sharon Steel Corp. plants showed a big lead for Lewis' SWOC, the Democratic voters rejected the CIO candidate by 3344 votes to 3058. Cambria county voted for Kennedy by 2141 to 1442. The town of Monessen, whether another NLRB election a year ago showed Pittsburgh Steel Co. employees as voting 10 to one for the SWOC, in the recent primary gave Kennedy, the SWOC candidate, barely a two to one advantage over his anti-CIO opponent.

Refusal of Pennsylvania Democrats to follow New Deal instructions and vote for Lewis' handpicked candidates rated as a political sensation with the unexpectedly heavy voting by Pennsylvania Republicans who, lacking the stimulus of the Democrats' bitter factional fight before the primary, nevertheless turned out 135,000 more voters than the Democrats were able to muster.

Republicans Choose James

In addition the Republicans battered Gifford Pinchot, Lewis' ally on the G.O.P. state ticket and CIO candidate for governor, by giving Superior Court Judge Arthur H. James, of Philadelphia, the nomination for governor by a lead expected to be more

than half a million votes. And Gov. Earle swamped Mayor Wilson, of Philadelphia his CIO-supported opponent, for the Democratic nomination for senator.

In Judge James' triumph, many business men and industrialists, like Ernest T. Weir, National Steel Corp. chairman, found indications of a Republican state victory at the polls this fall when Judge James will oppose Mr. Jones for governor. Mr. Weir said the "primary clearly shows we will triumph next November with a united party."

Here is what two of the CIO union leaders had to say of the election:

PHILIP MURRAY, SWOC chairman—"The CIO has scored a remarkable victory in the Pennsylvania primary election. The CIO demonstrated its strength to the tune of nearly a half million votes of confidence in its program and objectives, stopped the retreat from the New Deal by forcing everybody in the Democratic party to go forward with President Roosevelt, won the support of the farmers of the state, as demonstrated by the actual vote in the rural counties, to its broad principles of cooperation for the betterment of business, farmers and laborers."

DAVID DUBINSKY, president of the International Garment Workers Union, third largest CIO affiliate—"The political failure of the CIO in Pennsylvania, as indicated by the primary returns, may be attributed directly, in my opinion, to the division in the labor movement. The result yesterday in Pennsylvania amplifies the imperative need for labor unity (between the AFL and CIO)."

Third Machine Tool Electrification Forum

IN addition to the discussions reported in our issue of May 19, page 58, the third machine tool electrification forum held by the Westinghouse Electric & Mfg. Co., May 9-11, at East Pittsburgh, included two papers on the use of instruments, one in machine tool design and the other in testing. Other proceedings of the forum not covered in the previous report are also here outlined.

Use of graphic wattmeters for the inspection of vertical turret lathes, Mult-au-Matics, and Contin-U-Matics was described by A. H. Platt, electrical engineer, Bullard Co., Bridgeport, Conn., in a paper on "The Use of Graphic Wattmeters In the Building of Machine Tools." Twelve of these instruments equipped with strip type charts are now in use.

Two general methods of testing are employed. In the first the machine is driven by a test motor which has a switchboard type instrument permanently connected in the circuit. This method is used if the machine is to

FORMAL sessions of the third machine tool electrification forum were supplemented by inspection tours, including a visit to the Westinghouse research laboratories. Addresses by Dr. L. W. Chubb (in the foreground, at the right) and a number of his colleagues preceded the tour through the laboratories.

o o o

W. D. TURNBULL, manager machinery electrification, Westinghouse, describing new contactor unit to Tell Berna, general manager, National Machine Tool Builder's Association, during forum held May 9-11, at East Pittsburgh.

o o o

be belt driven in the user's plant, or if the customer chose to furnish and mount the motor, or where a test seems advisable in the earlier stages of the erection of a machine to which a motor would subsequently be applied.

The second method is that used when the machine, during test, is driven by the motor or motors which are to be applied to the finished machine. In such cases portable instruments are used.

Socket type instruments are being tried in the belief that they have application in these testing operations, particularly in the case of a socket and test jack for use in making quick and safe connections."

Socket-Type Instruments

Socket type instruments, their applications and advantages, were discussed by C. Anderson, instrument sales section, Westinghouse Newark, N. J., works, at the same session. These instruments, it was pointed out, provide a variety of indications from which the designer, plant superintendent, foreman and operator can determine and control unfavorable operating conditions contributing to non-uniformity of product, frequent interruption and delays. In the socket metering scheme described, a simple socket may be mounted permanently on the machine by the machine tool builder or a die cast socket may be mounted by the user on the machine, on the wall, or screwed into the conduit. Instruments of various capacities and for various types of measurement may be inserted alternately in the same socket.

Electrical refinements have been largely responsible for development of some of the oldest and most common types of machines out of the "ugly duckling" stage into the aristocracy of the "machine tool," said W. C. Tucker, Buffalo Forge Co., in a paper on "Improvements In Punches, Shears and Bending Rolls Based on Electrical Developments."

Foremost among the electrical refinements that have had so strong a bearing on the improvement of this equipment are: Improved motors and motor characteristics, gearmotors, more positive and highly sensitized electrical controls, as well as the great forward strides in the field of electric welding.

WATCHING a dynamometer test during the electrification forum. From left to right: Jesse Daugherty, Cincinnati Planer Co.; A. H. Heywood, Westinghouse motor sales; and E. D. Vancil, Cincinnati Milling Machine Co.

In an address on "Cooperative Sales Promotion with the Machine Tool Industry," W. D. Turnbull, Westinghouse manager, machinery electrification, outlined advertising and other recent promotional activities of his company in directing the attention of the metal working industries to the cost reducing possibilities of modern manufacturing equipment. The program was formulated in 1937 after correspondence with some 350 machinery building companies. More than 15,000 booklets on "Today's Challenge to Executive Ingenuity," prepared in connection with this promotional work, have been distributed.

Other papers at this forum included "Special Problems of Machining and Manufacture," by D. B. Charters, manufacturing engineer, Westinghouse generator works department; "Developments in Multipole Relays and Manual Starters," by D. L. Pierce, engineer, control engineering; "The Trend Toward Combination Line-starters," by E. G. Forgy, industrial control section, Motor Division Sales; and "Opportunities for the Electrical Engineer with the Machine Tool Builder," by R. S. Kersh, Machinery Electrification.

Laboratories Visited

Inspection trips, in addition to those mentioned, included a visit to the new motor manufacturing department and inspection of the new flood control equipment at East Pittsburgh, which prevents the Monongahela River from backing up the Turtle Creek Valley and pumps the creek over a dam gate with three 5000 hp. motors. Manufacture of the 46-ft. bearing for the 200-in. Mt. Palomar telescope was also seen.

A visit to the Westinghouse Laboratories on the evening of May 10, was enjoyed by more than 80. Dr. L. W. Chubb, director of research and several of his colleagues outlined various activities of the laboratories. This was followed by a tour of the building, including the sections devoted to photoelastic studies and to creep testing. Inspection of the atom smasher equipment was of outstanding interest. A dinner preceded this inspection of the laboratories. Speakers included Ralph Kelly, Westinghouse vice-president in charge of sales; C. B. Stainback, manager, industrial sales department; and Tell Berna, general manager, National Machine Tool Builders Association.

..PERSONALS..

A. J. JENNINGS has been appointed general sales manager of Cleveland Worm & Gear Co., Cleveland, and of its affiliate the Farval Corp., manufacturer of centralized systems of lubrication. Mr. Jennings has been directing Farval sales for many years, having gone to Cleveland in 1932 when the business was purchased by the Gear company and moved to Cleveland from Battle Creek, Mich. Assisting Mr. Jennings will be S. L. EASTMAN and C. R. BURRELL, both of whom have been affiliated with the company for several years.

❖ ❖ ❖

H. A. WOOFTER, has been appointed sales manager of the Progressive Welder Co., Detroit. Formerly he was chief engineer of the Federal Machine & Welder Co., Warren, Ohio.

❖ ❖ ❖

WILLIAM WILEY BROOKS has been appointed district sales manager of Wheeling Steel Corp. for the Atlanta territory. Mr. Brooks formerly was identified with the John C. Vance Iron & Steel Co., Chattanooga, Tenn.

❖ ❖ ❖

P. T. OLDHAM, who has been engaged for the past several years in special sales work for the Lukens Steel Co., Coatesville, Pa., has been appointed manager of special sales of the By-Products Steel Corp., division of Lukens Steel Co., Coatesville. He has been identified with the parent company since 1915.

❖ ❖ ❖

ROBERT A. SHAW, safety engineer of the Murray Corp. of America, was unanimously elected chairman of the Safety Supervisors Division of the Detroit Industrial Safety Council.

A. J. JENNINGS

L. R. JUDSON, of the Timken Detroit Axle Co., CLARK J. STROHMER, of the Michigan Bell Telephone Co., and J. C. KERRIGAN, of Chrysler Corp., were elected first, second and third vice-chairman, respectively.

❖ ❖ ❖

RALPH E. ROWLEY, chief civil engineer of Gary works of Carnegie-Illinois Steel Corp., and director of civil engineering during the erection of the Gary steel mills and the laying out of what is now the city of Gary, Ind., retired voluntarily last week to become head of the newly created Gary sanitary commission. Mr. Rowley, who is 67, started with the corporation's South Chicago works in 1889 as a waterboy and rose from one job to another until in 1904 he was chief civil engineer. G. G. Thorp, then president of the old Illinois Steel Corp., placed Mr. Rowley at the head of a corps of engineers in the spring of 1906 and charged him with the planning of a millsite and townsite at the south tip of Lake Michigan, where Gary now stands.

❖ ❖ ❖

JOHN W. HUMPHREY has been appointed superintendent of production and shipping at Carnegie-Illinois Steel Corp.'s new Irvin works, succeeding the late H. C. Ford. Mr. Humphrey has been associated with subsidiary

H. A. WOOFTER

W. W. BROOKS

P. T. OLDHAM

companies of U. S. Steel Corp. for more than 26 years.

❖ ❖ ❖

ROWLAND E. WILLIAMS has been appointed assistant superintendent in charge of machine tool and forge shop operations at United Engineering & Foundry Co.'s Youngstown plant. Mr. Williams succeeds GEORGE A. BAHM, who is leaving United to accept a position as superintendent of machine, forge, welding and boiler shops of the Youngstown Sheet & Tube Co. LEONARD ROUND succeeds Mr. Williams as foreman of shop No. 1.

❖ ❖ ❖

CHARLES S. DUVALL, of the Maryland Bolt & Nut Co., was elected president, C. H. MICHEL, Maryland Metal Building Corp., was elected vice-president, and H. R. DORNEY, Jones & Laughlin Steel Corp. was elected secretary-treasurer, of the Steel Club of Baltimore at its annual meeting held May 6. The following directors were also elected: J. E. ALDRIDGE, Bartlett-Hayward division, Koppers Co.; F. H. CARTER, Maryland Dry Dock Co.; ANDREW J. SNOW, Carnegie-Illinois Steel Corp., and CHARLES W. TEST, Youngstown Sheet & Tube Co.

❖ ❖ ❖

R. C. WIETERSEN, was recently appointed general purchasing agent at Hercules Motor Corp., Canton, Ohio.

❖ ❖ ❖

LEWIS E. JOHNS has been appointed assistant chief of service bureaus, Carnegie-Illinois Steel Corp., Pittsburgh. Mr. Johns has been identified for the past nine years with the Bell Telephone Co. of Pennsylvania.

❖ ❖ ❖

CHARLES E. MOURER has been appointed district sales manager, Pittsburgh Coal Co., Pittsburgh, succeeding HARRY S. MATTHEWS, who goes to Cleveland as district sales manager. ELMER C. STRIEBEL, former district sales manager, Cleveland, has been appointed sales promotion manager, Pittsburgh. Additional appointments are: WILLIAM B. POINDEXTER, as assistant general sales manager, Pittsburgh; WALTER G. WILHELM, as Lake sales manager, Cleveland, and A. H. WAUGH, assistant Lake sales manager, Detroit.

❖ ❖ ❖

ROBERT E. PIERCE has been appointed district sales representative of the Kansas City sub-office of the St.

What Price SCRAP?

G-H Hydraulic Balers compress scrap iron and metal into tight, smooth, uniform bales of maximum density . . . at low cost.

Compact bales command higher prices than loose, bulky scrap, save labor in handling, reduce shipping costs and permit storage of larger tonnage in limited space. Every saving a price advantage!

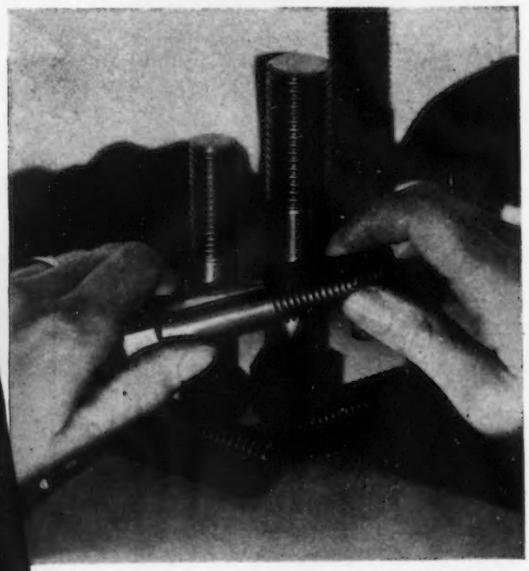
Capacities—¼-ton to 15 tons per hour . . . Double and Triple Compression.

Write for illustrated bulletins.

GALLAND-HENNING MFG. CO.
2750 S. 31st STREET • MILWAUKEE, WIS.

G-H HYDRAULIC and ELECTRIC BALING-PRESSES and HYDRAULIC PUMPS

BY THE BOX OR BY THE MILLION!



Kaufman PROCESS » » IS A METHOD OF MAKING BETTER cap screws

• Of course you can get cap screws which may meet your requirements that are not made by the Kaufman Process. But why not get greater strength and accuracy of fit when it costs you no more? Thread strength and accuracy is far greater in a cap screw made by the Kaufman Process, *patented*, our own plant development—than by any other method. Finish is improved—wrench fit is uniform—and a Class 3 fit insured. New standards of cap screw quality were set up when the Kaufman Process was developed. Ask for samples. THE CLEVELAND CAP SCREW COMPANY, 2929 East 79th Street, Cleveland, Ohio.

Address the Factory or Our Nearest Warehouse:

CHICAGO, 726 W. Washington Blvd.
PHILADELPHIA . 12th & Olive Sts.
NEW YORK . . . . 47 Murray Street
LOS ANGELES . 1015 East 16th St.

CLEVELAND CAP SCREWS
SET SCREWS • BOLTS AND NUTS

Louis district sales office of Jones & Laughlin Steel Corp.

❖ ❖ ❖

W. C. COWLING, of Willys-Overland Motors Co., Inc., has been appointed chairman of the committee to nominate directors at the annual meeting of the Automobile Manufacturers Association in Detroit on June 9. The other members of the committee are: HARRY J. KLINGLER, Pontiac division

W. J. McARDLE, whose resignation as general sales manager of the Allegheny Steel Co., Brackenridge, Pa., was announced in these columns last week.

of General Motors Corp., and R. W. RUDDON, Federal Truck Co.

❖ ❖ ❖

J. R. MCELVEEN has been appointed office manager of Carnegie-Illinois Steel Corp.'s district sales office at Detroit.

❖ ❖ ❖

C. J. KENNEDY, who has been identified with the McAleer Mfg. Co., Detroit, for a number of years, has been appointed sales manager.

❖ ❖ ❖

WALTER K. GRAHAM, annealing foreman at the Fairfield sheet mill of the Tennessee Coal, Iron & Railroad Co., Birmingham, has been awarded one of the five competitive fellowships offered through the Alfred P. Sloan Foundation for a year of graduate study in business admin-

READING *works with speed and safety on* **GENERAL'S** *loading platform*

This single drum Reading Electric Hoist does all the heavy lifting at General Cigar Company's loading platform in Lancaster, Pa. One man and his rugged Reading companion handle the heavy cases *easier, faster* and *safer* than back in the old "man and muscle" era.

Reading units such as this have performed similar cost-reducing jobs in all sorts of plants, warehouses, foundries. Write or wire us for complete data on your handling specifications.

READING CHAIN & BLOCK CORP., Reading, Pa.

READING

CHAIN HOISTS • ELECTRIC HOISTS
TRAVELING CRANES • MONORAIL SYSTEMS

5050 Youth and Experience Combine to make
DUNBAR SPRINGS
Looking ahead—training skilled workers with an eye to your future, as well as present Spring Needs!
for Conscientious Attention
Send your Springquiries to
DUNBAR BROS. CO.
DIVISION OF ASSOCIATED SPRING CORPORATION
BRISTOL, CONN.

istration and economics at the Massachusetts Institute of Technology.

❖ ❖ ❖

IRVING M. MARTIN has been appointed superintendent of mills of the Wrought Iron Co., Lebanon, Pa., succeeding V. F. ACHE, who has resigned.

❖ ❖ ❖

BENNETT CHAPPLE, vice-president of the American Rolling Mill Co., Middletown, Ohio, returned to his desk recently after a long illness.

❖ ❖ ❖

WALTER D. JONES, vice-president of International Business Machines Co. Ltd., of Canada, has been elected chairman of the board.

❖ ❖ ❖

H. W. GRAHAM, general metallurgist, Jones & Laughlin Steel Corp., Pittsburgh, has been named vice-chairman of the executive committee of the newly-formed Industrial Research Institute, New York, a national organization composed of scientific research executives of middle-sized and small-sized industries.

❖ ❖ ❖

W. P. GETTY, JR., has been appointed to the sales staff of the American Screw Co., Providence, to cover metropolitan New York and the State of New Jersey. J. J. COY will cover the Middle West from Detroit, and JOHN S. DODGE will handle New England.

❖ ❖ ❖

ANDREW C. GRAHAM, formerly manager of the Chicago office of the Jessop Steel Co., Washington, Pa., has been appointed Western sales manager with headquarters in Chicago by S K F Steels, Inc., New York.

❖ ❖ ❖

FRED S. GICHNER, president of the Fred S. Gichner Iron Works, Washington, was given a reception on May 11 in celebration of the 40th anniversary of the establishment of the company by him in May, 1898.

❖ ❖ ❖

J. B. WITTRUP, for 23 years connected with the Manhattan Rubber Mfg. division of Raybestos-Manhattan, Inc., Passaic, N. J., has been made manager of the Chicago mechanical rubber branch of the company.

❖ ❖ ❖

HARRY H. GREEN, for 37 years superintendent of the Albion Malleable Iron Co., has retired.

❖ ❖ ❖

H. R. JESSON, once president of the Vento Steel Products Co., Muskegon, Mich., has again been elected to that post. He succeeds the late J. M. MERCER. Mr. Jesson served as president from 1935 to 1938, during which time Mr. Mercer was vice-president.

❖ ❖ ❖

WALTER O. BRIGGS, JR., has been elected a director of Briggs Mfg. Co., succeeding H. W. GRIFFITH, who continues as secretary.

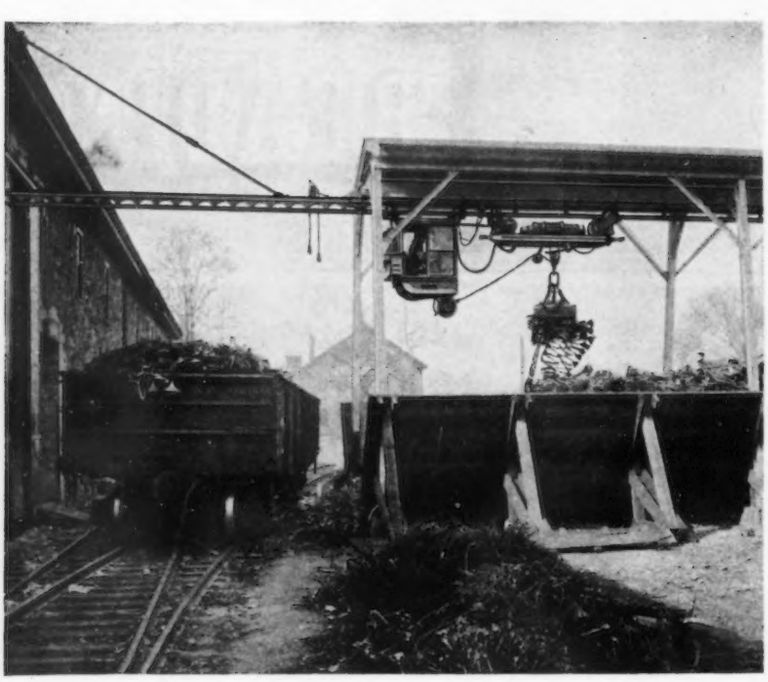
❖ ❖ ❖

JAMES R. DUNSFORD, formerly of Pittsburgh, has been elected president of the Wilson Foundry & Machine Co., Pontiac, Mich. He succeeds CHARLES E. WILSON, who will continue on the board of directors. Mr. Dunsford also has been added to the board.

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT

In the Metal Working Industry



- **Jib cranes are efficient equipment for extending Cleveland Tramrail over railroad tracks or for servicing cars and loading docks.**
- **Moving of scrap from the shop floor to storage bins or car is done inexpensively with a cab controlled carrier and electro magnet.**

ALSO BUILDERS OF

CLEVELAND CRANES

FOR EVERY INDUSTRY

CLEVELAND TRAMRAIL

Division of

THE CLEVELAND CRANE & ENGINEERING CO.

1115 Depot St.

WICKLIFFE, OHIO

Or consult your phone directory under Cleveland Tramrail.

Franklin Institute Has Ajax Exhibit

THE Ajax Electrothermic Corp., Trenton, N. J., has donated to the Franklin Institute, Philadelphia, an exhibit which shows the heating effect of induced high frequency currents. All parts of the equipment for generating the high frequency current are visibly arranged in a glass case, enabling one interested to trace the circuits and, as he pushes a button, to see just what happens during the heating cycle.

A note on the exhibit states that induction furnaces of 8-tons capacity are in regular operation producing steel, while approximately 100,000 kw. of energy have been installed for inductive melting, differential heating, surface hardening and other heat treating operations.

Bethlehem Acquiring United Shipyards, Inc.

BETHLEHEM STEEL CORP. was expected this week to take over properties of United Shipyards, Inc., following a meeting of United stockholders. The deal involves United Morse & Crane plants in Brooklyn, the Staten Island Shipbuilding Co. at Mariner's Harbor, S. I., and Fletcher's yard in Hoboken. United Shipyards was organized in 1928 as United Drydocks, Inc., and acquired 24 floating drydocks in the New York harbor.

Westinghouse Salaries Reduced 10 Per Cent

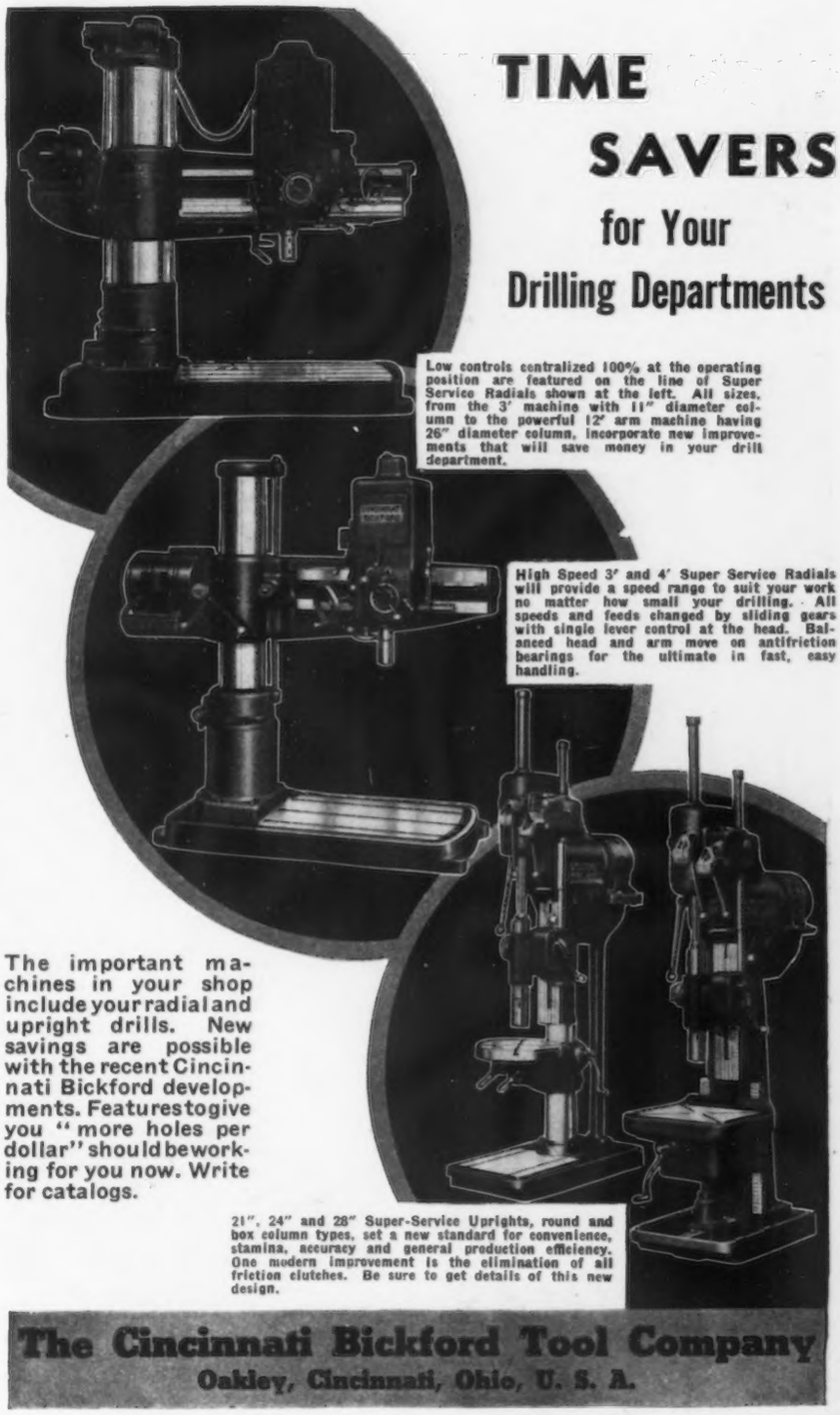
WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., has announced a readjustment of employees' salary rates effective June 1. The new level will be 90 per cent of present salary rates. The revision will affect 13,000 salaried employees including all executives but does not apply to hourly paid employees, many of whom have already received reduction through reduced hours of work. The Westinghouse wage and salary plan will operate on the new base rates to be established June 1.

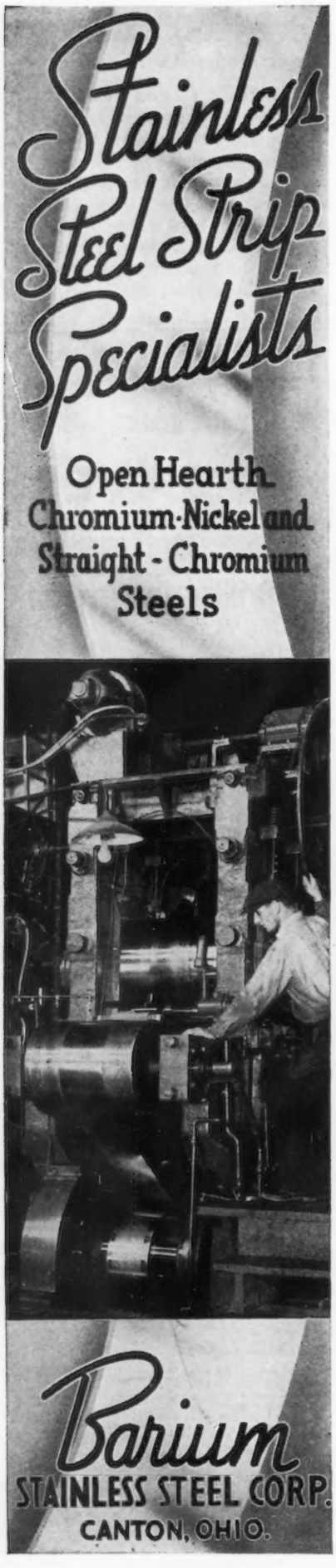
S. A. E. Summer Meeting At White Sulphur, June 12

THE national summer meeting of the Society of Automotive Engineers will be held at White Sulphur Springs, W. Va., June 12-17. Assistant Secretary of War Louis Johnson is scheduled to speak at the opening banquet on "Automotive Obligations and Responsibilities." Dr. James S. Thomas, president of Chrysler Institute of Engineering, will discuss "Economics of Weight and Size for the Car of Tomorrow," and William J. Cameron of the Ford Motor Co. will speak at a general session Thursday, June 16. Other speakers during the week will discuss automotive engineering problems.

U. S. Workers On Job Fewer Hours For Food

EUROPEAN steel workers last year had to work 3.5 hr. to 23.5 hr. to buy a basket of food which American steel workers could buy with wages received for only 1.5 hr. work, according to a comparison by the American Iron and Steel Institute. Living standard of French workers is best and the Russian standard poorest, the institute figures show.


TIME SAVERS
for Your
Drilling Departments
Low controls centralized 100% at the operating position are featured on the line of Super Service Radials shown at the left. All sizes, from the 3' machine with 11" diameter column to the powerful 12' arm machine having 26" diameter column, incorporate new improvements that will save money in your drill department.
High Speed 3' and 4' Super Service Radials will provide a speed range to suit your work no matter how small your drilling. All speeds and feeds changed by sliding gears with single lever control at the head. Balanced head and arm move on antifriction bearings for the ultimate in fast, easy handling.
The important machines in your shop include your radial and upright drills. New savings are possible with the recent Cincinnati Bickford developments. Features to give you "more holes per dollar" should be working for you now. Write for catalogs.
21", 24" and 28" Super-Service Uprights, round and box column types, set a new standard for convenience, stamina, accuracy and general production efficiency. One modern improvement is the elimination of all friction clutches. Be sure to get details of this new design.
The Cincinnati Bickford Tool Company
Oakley, Cincinnati, Ohio, U. S. A.



Workers Increased With New Sheet Mills, Institute Says

THE number of steel workers increased due to widespread adoption of continuous rolling mills and other modernized mill equipment from 1926 to 1937, the American Iron and Steel Institute reports.

In a study answering claims that technological progress in steel is swelling ranks of the unemployed, the institute's job study shows that:

1—Employment in four leading companies operating continuous mills for all or most of the years 1926-1937, gained 28 per cent against only 23 per cent for the entire steel industry.

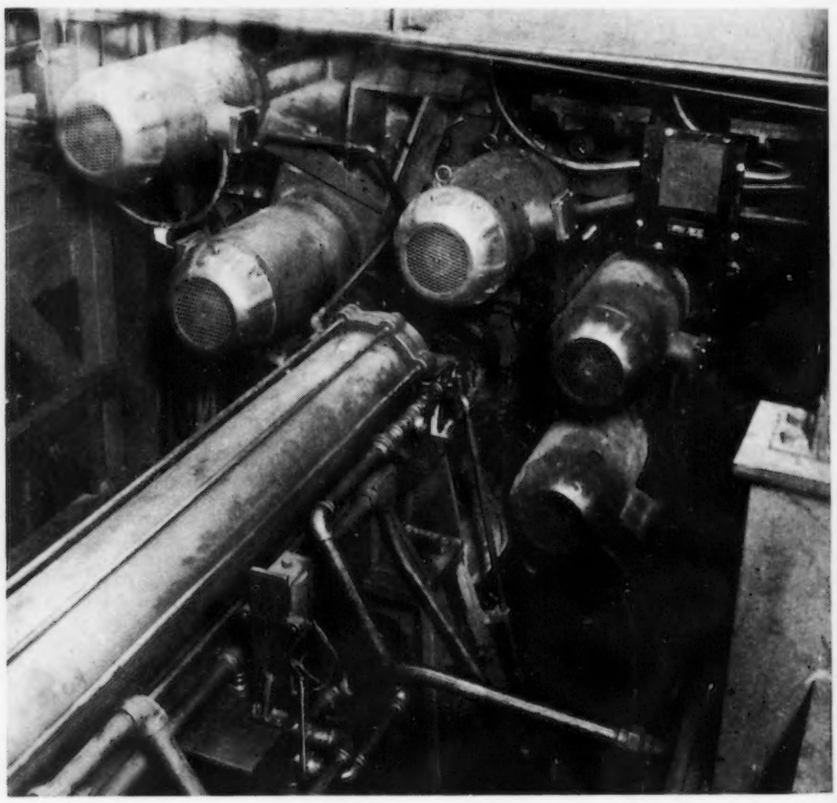
2—Sheet steel manufacturers without continuous mills employed 25 per cent more men in 1937 than in 1926.

3—The 11-year employment increase for all sheet producing companies resulted from a reduction in working hours from 54 to under 40 a week, and by greatly increased output, of better quality and at lower prices made possible by the continuous mills which, the institute finds, has "served both to lighten the physical toil involved in steel production and to increase labor's productivity and earning ability."

From 1926 to 1937, sheet steel production rose 85 per cent from 4,200,000 to 7,800,000 gross tons, with the increase substantially greater than for other steel products so that in 1937 sheet steel represented 21 per cent of finished steel produced against 12 per cent in 1926.

While the above gain was largely increased output from continuous mills, 1937 production of non-continuous mills at 846,000 tons was close to the 1926 total of 935,000 tons.

Its findings, the Institute concludes, indicate that increased sheet production is going principally into products not important sheet outlets prior to the continuous mills or products that could not be fabricated from the quality of sheets formerly available.



THE high temperatures and space limitations encountered by steel-sheet coiler motors makes it difficult to build a sufficiently small self-ventilated motor. By using a welded steel frame, these Westinghouse motors were made smaller in diameter. At the same time, improvements in design made possible a shorter motor. The result was a decrease in overhang and in vibration and maintenance.

Book on Aluminum Now Available

"ALUMINUM," by Douglas B. Hobbs, has just been offered for sale by the Bruce Publishing Co., Milwaukee. This 295-page treatise covers the history, metallurgy, and uses of aluminum in a particularly readable and informative manner, and even includes a certain number of study and construction projects for school and home shops.

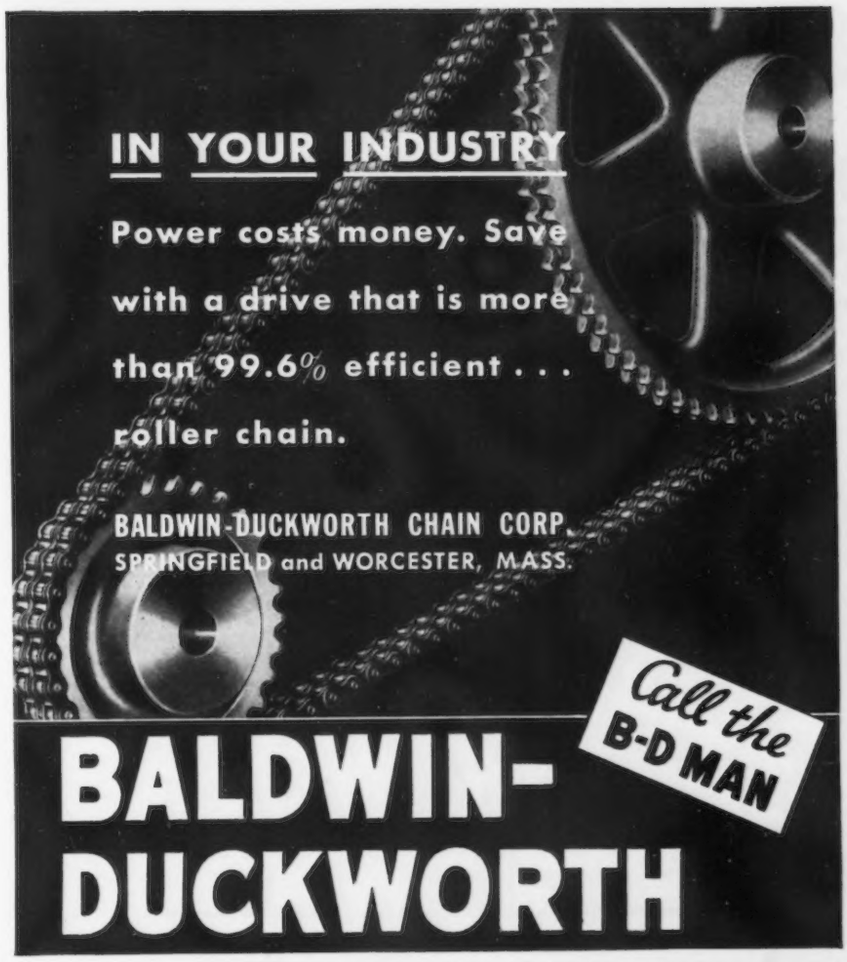
In this book, Mr. Hobbs combines the theory of aluminum metallurgy and metal working with the actual use of the metal in making projects which involve many of the processes by which aluminum is cast, worked and shaped. The latter part of the book contains detailed data on the construction of 25 useful articles which may be fabricated from standard aluminum sections.

Austin-Hastings Plans Machine Tool Show

AUSTIN-HASTINGS CO., Inc., machine tool distributer of Cambridge, Mass., announces a machine tool, welding and sheet metal working equipment show, to be held at the Boston Garden Exposition Hall, North Station, Boston, June 8 to 11. About 24 machine tools, 20 brakes, shears, rolls and other sheet metal machinery, and a number of arc welding generator sets, spot, flash and seam welding machines and oxy-acetylene welding and cutting equipment are to be displayed. All machines will be under power. Exhibit hours are from 9 a.m. to 9 p.m. and admission is free.

Develops Dry Blanket For Molten Metal Baths

A new galvanizers' blanket, known as G-B 412, is being marketed by the Gray Chemical Co., Roulette, Pa. The material is a granular, fireproof, activated carbon, impregnated with an inorganic material. It is used as an insulating dry blanket covering for molten metal baths of zinc, lead, tin and their alloys. Besides preventing the formation of oxides and materially reducing dross, it is also claimed that it will reduce heat losses by 35 to 50 per cent. Its chief application is in the manufacture of wire, poultry netting, hardware cloth and galvanized pipe.


IN YOUR INDUSTRY
Power costs money. Save with a drive that is more than 99.6% efficient . . . roller chain.
BALDWIN-DUCKWORTH CHAIN CORP.
SPRINGFIELD and WORCESTER, MASS.
Call the B-D MAN
BALDWIN-DUCKWORTH

SPRINGS
FOR EVERY MECHANICAL NEED
COIL SPRINGS
FLAT SPRINGS
WIRE SPECIALTIES
WIRE FORMS
STRICT ADHERENCE to specifications is a fundamental policy of "American." When you buy American springs, you can be sure that each individual spring will be made in exact accord with your original design—to specified dimensions, tolerances, strength and resiliency.
SNAP RINGS
LOCK SPRINGS
SPECIAL SPRINGS
from Every Type of Wire up to & including ½ dia.
Send for Quotations
AMERICAN SPRING
AND MANUFACTURING CORPORATION
PARK AVE. HOLLY MICHIGAN

Bethlehem Cancels Stock-Buying Plan

BETHLEHEM STEEL CORP. stockholders have voted to cancel the management's stock-ownership plan under which 92 employees, including 12 directors, have been paying for shares out of earnings. The vote by shares, authorizing the management to reimburse the participants for payments made, was 3,065,412 against 5235.

Charles M. Schwab, Bethlehem founder, declared that "times and conditions" have now made the plan impractical. "Because of reduced earnings and increased income taxes, the purchasers of the stock would not be able 'within any reasonable time' to complete payment for the shares," he said.

No operations just like yours

Cleaning operations may be fairly complex, considering the various kinds of metals, the variety of greases or compounds to be removed, differences in time allowances, differences in plant equipment. But the group of Wyandotte Metal Cleaners is so complete, so varied, that it is usually possible to meet individual requirements without much experimenting.

We'd be glad to study your cleaning problems—no obligation on your part, of course.

Wyandotte
Clean "Chemically" Clean
Metal Cleaners

Service Representatives in all parts of U. S. A. and Canada

District Offices in 27 Cities

THE J·B·FORD COMPANY
WYANDOTTE MICHIGAN

Stainless Steel, Inc., Is Formed At Chicago

CHICAGO.—Stainless Steel, Inc., a new firm with headquarters at Kewaskum, Wis., has been formed to manufacture a complete line of stainless steel ware. The firm has its general sales office and showrooms in the Merchandise Mart. Harry B. Klusmeyer, formerly vice-president of Aluminum Products Co. and Stainless Steel Products Co., is president of the new firm. A. L. Rosenheim, Jr., secretary-treasurer, Kewaskum Aluminum Co., is vice-president, and C. S. Keating, sales manager of Kewaskum, is secretary.

General Engineering & Mfg. Purchases Plant In Newark

GENERAL ENGINEERING & MFG. CORP., recently organized, has purchased a building at 35 Verona Avenue, Newark, N. J., and will manufacture special machinery and tools. Joseph Strobel, former president of Pathe Engineering & Tool Mfg. Co., Long Island City, L. I., is president. H. B. Russell, former president of Aircraft Hardware Mfg. Co., New York, is secretary and treasurer. L. H. Wadsworth, of the National Flexible Shaft Mfg. Co., is vice-president.

Republic Acts to Keep NLRB Record Untouched

WASHINGTON. — Counsel for Republic Steel Corp. asked the Supreme Court Monday to uphold the action of the Federal Circuit Court of Appeals at Philadelphia which required the NLRB to file the record of the Republic case and restrained it from reopening the case. The Supreme Court took the case under advisement.

In a brief filed with the Supreme Court on Monday, Republic Steel Corp. argued that action against the three judges would be an extraordinary procedure; that jurisdiction of the court in Philadelphia to enter the order against the NLRB is specifically authorized by statute; that the board's power to modify or set aside an order prior to the filing of a transcript in a case does not apply to proceedings instituted by an aggrieved person as in the case in controversy; and that the board's failure to file the transcript in the case when it was in its possession was in violation of the law.

Upswing by Mid-August Seen By Purchasing Agents' Head

RECOVERY in buying of almost all commodities will be resumed by mid-August or early September, George P. Brockway, president of the National Association of Purchasing Agents, predicted this week at the association's 23rd annual convention in St. Louis.

Mr. Brockway, purchasing agent for the American Optical Co., Southbridge, Mass., told the 1400 persons attending that the recession has touched its low point and the next development will be an upswing. Purchasing agents representing "billions of dollars of purchasing power" are "planning and preparing for the time when demand will overtake supply and purchases will have to be made," he said.

This forecast, based on a trip through the nation's major industrial centers, was supported in part by other convention speakers such as Daniel C. Roper, Secretary of Commerce; Raymond Moley, editor of *Newsweek;* Howard Coonley, chairman of the Walworth Co., New York, and Dr. A. A. Bates, of Westinghouse Electric & Mfg. Co., Pittsburgh.

Roper Sees Upturn

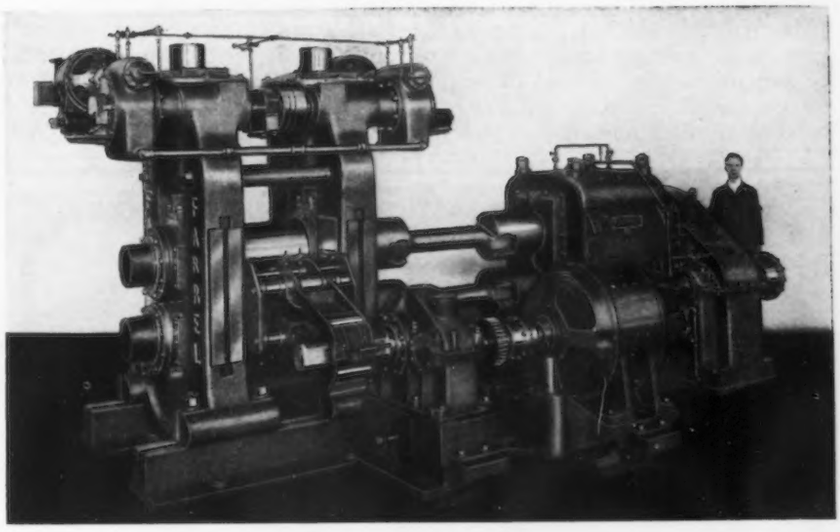
Here are the highlights of what some of the convention speakers said:

MR. ROPER—"Inventories which were heavy six months ago have been reduced in most lines of trade. There has been no overbuilding in the heavy industries to impair the potentialities of that market. Money and credit are available in abundance and the banking business is sound. Security and commodity prices in many cases have declined to points which usually provide an impetus for business revival."

MR. MOLEY—"All business men should concentrate this fall on the election of a 'recovery Congress.' The recovery of our economic life depends on Congress. Washington has 'manufactured fear' and spattered business with mud. No amount of conferring at the White House or anywhere else will change the Administration's viewpoint. The Administration is definitely 'anti-business.'"

MR. COONLEY—"It is essential for our future that there be a frank recognition that business and Government are partners in a common enterprise and not adversaries. A lack of confidence is at the root of today's troubles and confidence can and will be restored if Government and business will again resume their proper roles. The underlying cause of the conditions existing in business today is the destruction of confidence brought about by unsound, vacillating and inconsistent Government policies."

DR. BATES—"Few previous opportunities in industrial history have been as attractive as that offered American business men today in meeting the pressing demand for homes. I am convinced that before many years most of you will be engaged primarily in purchasing materials for the production and furnishing of homes. The development of the continuous method of rolling steel and cheap, effective welding processes are making mass production of homes possible."



FARREL
HIGH SPEED BRASS MILL

This mill is designed to roll brass strip up to 750 feet per minute. It has 18" x 24" alloy iron rolls, with journals operating in precision type, flood-lubricated sleeve bearings and connected to the pinion stand by universal spindles.

The double motor screw-down provides individual adjustment for each screw or simultaneous adjustment of both. A magnetic clutch permits the separate operation of each screw or their synchronization when both ends of the roll are to be adjusted together. A Selsyn-controlled indicator on the operator's desk shows the amount of adjustment to .0001", enabling the operator to control the gauge of the strip very closely.

The material is blocked on solid blocks at constant tension and is wrapped by means of a jaw type wrapper. Full blocks are stripped by an air-operated stripper.

The reduction gear drive and pinion stand are combined in an integral unit, with Sykes continuous tooth herringbone gears and pinions mounted in anti-friction roller bearings. Built-in oil pump provides spray lubrication of the gear teeth and flood lubrication of the bearings. This mill is typical of the modern design features built into Farrel Rolling Mills which permit high speed operation, increase output, improve quality and reduce production costs.

FARREL
FARREL-BIRMINGHAM COMPANY, Inc.
ANSONIA, CONN.
New York • Buffalo • Pittsburgh • Akron • Chicago • Los Angeles

Heavy Scrap Exports Ruinous, Wolcott, of Lukens Steel, Says

ST. LOUIS.—Government restrictions on exporting of steel scrap were urged this week by Robert W. Wolcott, president of Lukens Steel Co., Coatesville, Pa., in an address at an iron and steel dinner held in conjunction with the convention of the National Association of Purchasing Agents.

Mr. Wolcott said heavy scrap exports on a "ruinous scale" threaten the national welfare in case of war, and cuts employment in the United States by enabling foreign steel plants to reduce their purchases of steel in this country. He continued:

"When you send almost 11,000,000 tons out of this country in four years you are draining the scrap reservoir at a rate that will be felt when the steel industry gets back to the operating rate which we all are hoping for." Restrictions similar to those on tin plate scrap exports, which require a presidential license, were advocated by Mr. Wolcott rather than an embargo.

With all these points Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel, disagreed. Said Mr. Schwartz at the dinner:

"There is no record of any steel mill or foundry in the United States having to close down or having been handicapped on account of a lack of scrap. On the contrary . . . there is plenty of scrap on hand today at bargain prices for all immediate requirements, which will automatically replenish itself as the law of supply and demand will bring out additional tonnages, as it always has done. Of all industrial raw materials used for war purposes, scrap is least important."

75th Birthday for Oliver Iron & Steel

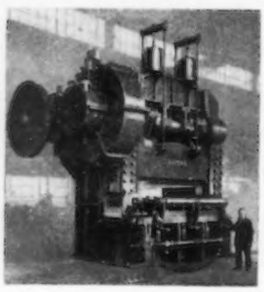
HAVING developed into one of the leading manufacturers of bolts, nuts, rivets, forgings, pole line hardware and other products since it was founded in 1863 by Henry William Oliver, Oliver Iron & Steel Corp., Pittsburgh, observed its 75th anniversary last week.

Leading steel industrialists who at one time or another worked at its Pittsburgh plant include Tom M. Girdler, chairman, Republic Steel Corp.; E. T. Weir, chairman, National Steel Corp., and James A. Farrell, retired president, United States Steel Corp. Henry S. Devens is chairman and Theodore F. Smith president.

Oliver H. Van Horn Co., Inc., New Orleans, La., with branches at Houston, Texas, Shreveport and Baton Rouge, La., has added the complete line of Stanley Electric Tools to its stock of supplies and equipment for the industrial and automotive trade.

PRESSES • DIES • METAL-FORMING MACHINERY

FABRICATING MACHINERY



New Thomas Shear

Specially heavy, all steel machine, designed for shearing aluminum slabs up to 2 inches thick and 80 inches wide, in connection with mill train. The gears are herringbone, completely enclosed and running in oil. The clutch is electrically controlled. This type of machine is built in all sizes.

PUNCHES • SHEARS • SPACING TABLES

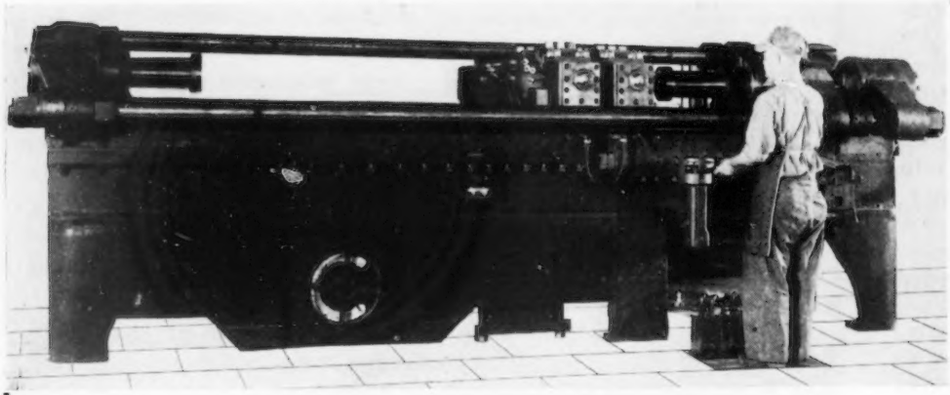
THOMAS

MACHINE MANUFACTURING COMPANY

Name changed from Thomas Spacing Machine Co.

PITTSBURGH, PA.

BENDING AND STRAIGHTENING MACHINES • MULTIPLE DRILLS



A 750 KV A Swift Flash Welder

SWIFT ELECTRIC WELDER CO.

6560 EPWORTH BLVD., DETROIT

Welding machines hand, hydraulic, cam or air operated of the following types: spot, seam, projection, flash, butt, flue and pipe, also gun welding units.

Machine Tool Dealers Meet in Detroit

REPRESENTATIVES of the three largest automobile manufacturers contributed to the discussions at the sales clinic, which was the highlight of the spring meeting of the Associated Machine Tool Dealers of America at Dearborn Inn, Dearborn, Mich., Monday and Tuesday of this week. A registered attendance of 80 members, who represented every section of the country from California to New England, was an increase of 20 per cent over any previous spring meeting. More than 210 people attended the banquet Monday evening to hear William J. Cameron of the Ford Motor Co. speak on the topic "Machines Create Employment." The sales clinic keynote was sounded at the opening session Monday morning by A. G. Bryant of the Bryant Machinery and Engineering Co., Chicago, and president of the association. Bryant spoke after George F. Turner of the Strong, Carlisle & Hammond Co., Cleveland, president of the Detroit area tool dealers, had welcomed the delegates.

George Habicht of Marshall & Huschart Machinery Co., Chicago, said that machine tool dealers have a responsibility to train their salesmen so they are able to talk concretely and intelligently to the customer rather than generalize and waste an hour just because the customer has given the salesman an appointment for an interview.

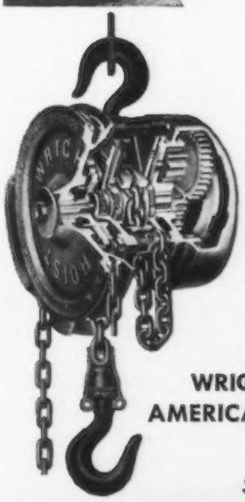
Other speakers at the opening session were G. J. Hawkey of the Cleveland Duplex Machinery Co., Inc., Cleveland, who spoke on "Using the Office to Help the Salesmen"; Jack C. Carlton, of Calco Machinery Co., Philadelphia, and Carlton Machine Tool Co., Cincinnati, who spoke on "Selling Machine Tools by Selling Facts," and E. H. Jones of the E. H. Jones Machine Tools, Ltd., London, a member of the executive committee, Machine Tool Trade Association of Great Britain, whose topic was "The Position of the Machine Tool Dealer in England."

The automotive speaker at this session was Henry G. Weaver, director Customers Research Division, General Motors Corp. He stressed the necessity of customer research in the machine tool field and urged the application of an engineer's attitude toward people, studying their reactions just as materials or mechanical devices are studied.

At the Tuesday morning session, a report on the 1938 Leipzig Fair was given by N. P. Lloyd, of Lloyd & Arms, Inc., Philadelphia, and greetings from Europe were heard through Hugo Stokvis, president of R. S. Stokvis & Zonen, Rotterdam, Holland. Howard W. Dunbar, president of the National Machine Tool Builders Association, extended greetings from the manufacturers. "What the machine tool buyer wants to know from the machine tool seller" was stated concisely by David A. Wallace, president, Chrysler Division, Chrysler Corp., Detroit. Speaking of the things that have been of particular interest to himself and his own mechanical department, Mr. Wallace asked machine tool men to provide easy chip removal. He also urged some simple type of screw or belt conveyor to carry away chips, turnings and borings. "The filtering of solutions and removal of the residue certainly has not been solved," Mr. Wallace declared.

June 2 Issue Will Be One Day Later

OWING to the holiday Monday, May 30, the June 2 issue of THE IRON AGE will go to press on Wednesday instead of Tuesday, and delivery of copies to subscribers will be one day later than usual.



● When headroom is at a premium and the steps in production are spread over a wide area, the Wright Improved High Speed Hoist is the Right Hoist for the job. ● It has speed. It is easy to operate. The ball bearings supporting the load wheel greatly facilitate lifting. The safety load chain guard, electrically welded special alloy steel load chain, and drop forged hook insure absolute safety. The zinc coated finish reduces depreciation from corrosion. . . . This hoist has twenty-one fine mechanical features that insure efficiency and long life.

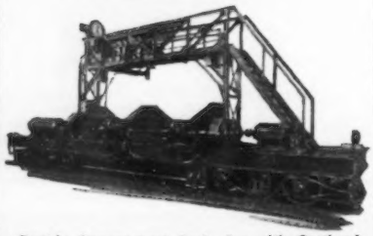
WRIGHT MANUFACTURING DIVISION
AMERICAN CHAIN & CABLE COMPANY, INC.
YORK, PENNSYLVANIA

In Business for Your Safety

ACCO

WRIGHT *Improved High Speed* **HOISTS**

ATLAS CARS



Double Compartment Scale Car with Overhead Operator's Platform. Car provided with Orr Bin Gate Operating Mechanism.

20 Ton Capacity Double Compartment Scale Car for use with Orr type Bin Gates controlled from Operator's Station on Scale Car.

Atlas Products

Gas-Electric and Diesel-Electric Locomotives

Electric Transfer Cars for Blast Furnaces and Steel Plants

Stockhouse Scale Cars for Blast Furnaces

Concentrate and Calcine Cars for Copper Refineries

Automatic and Remote Controlled Electric Cars

Pushers, Levellers and Door Extractors

Coal Charging Lorries, Coke Guides and Clay Carriers

Atlas Patented Coke Quenching Cars for By-Product Coke Ovens

Atlas Patented Indicating and Recording Scales

Special Cars and Electrically Operated Cars for every conceivable purpose.

THE ATLAS CAR & MFG. CO.

Engineers - Manufacturers

1140 Ivanhoe Rd., Cleveland, O.

European Steel Cartel Due For Renewal at End of June

LONDON (*by mail*).—At the meeting of the Joint Co-ordinating Committee of the International Steel Cartel at Brussels on May 11 delegates devoted themselves to a consideration of the general steel market situation and an examination of the progress of the negotiations with the Belgian producers. The Belgians also met separately to discuss the revival of the existing national agreement, and although no final decision was arrived at, they are stated to be optimistic about a successful conclusion of the negotiations in the near future.

On May 12 there was a meeting of the management committee of the Sales Comptoirs, at which it is understood the question of prices was considered. It is very unlikely that these will be changed, except possibly for certain countries such as Sweden, where a small increase of existing tariffs is not unexpected.

The Cartel agreement is due for renewal at the end of June and until then there will certainly be no general revision of prices, although it is admitted that there will then probably have to be some readjustment for certain markets.

An important meeting of the Cartel is scheduled for May 24 at Rome, when it is expected that the question of the renewal of the agreement will be confirmed. It is assumed that, in the interim, a definite understanding with the various Belgian producers will have been reached.

At the Rome conference the opportunity will also be taken to hold meetings of the Tinplate Cartel, International Railmakers' Association and the Comité des Comptoirs, as the Italian steel industry is interested in these bodies.

If, as is anticipated, the renewal of the International Steel Cartel is agreed upon at the forthcoming Rome conference, the establishment of a cartel of cold rolled steel hoop producers on the Continent will be assured.

The new cartel would allot quotas as follows: Germany, 50 per cent; Belgium, 30 per cent; France, 12 per cent, and Luxemburg, 8 per cent. A general agreement on prices has, of course, been in operation for some time.

Richberg to Address Business "Teamwork" Meeting in Detroit

TO crystallize and coordinate varying viewpoints of Government, business and labor, a conference has been arranged for Detroit, June 14, by the National Industrial Advertisers' Association, representing the country's leading manufacturers and the Associated Business Papers, composed of the nation's major business periodicals.

Under the chairmanship of J. H. Van Deventer, editor of THE IRON AGE, the conference has invited leading exponents of Federal, labor, and industrial viewpoints to address the gathering. Donald Richberg will give his views on the possibilities and problems of Government cooperation with business in an address entitled "Team Work for Prosperity." Others to speak include William J. Cameron, Ford Motor Co., and Assistant Attorney General Thurman W. Arnold.

Participating are such organizations as the Michigan Manufacturers' Association, Machine Tool Association of Detroit, Screw Machine Products Association, American Welding Society, Society of Automotive Engineers, and the Purchasing Executives Association of Detroit.

The "Industrial Marketing Conference" is under the direct sponsorship of the Detroit chapter of the National Industrial Advertisers Association in conjunction with the Advertising Federation of America, which will hold its annual convention in Detroit the week of June 14.

Large Sheet Mill to Be Built in Australia

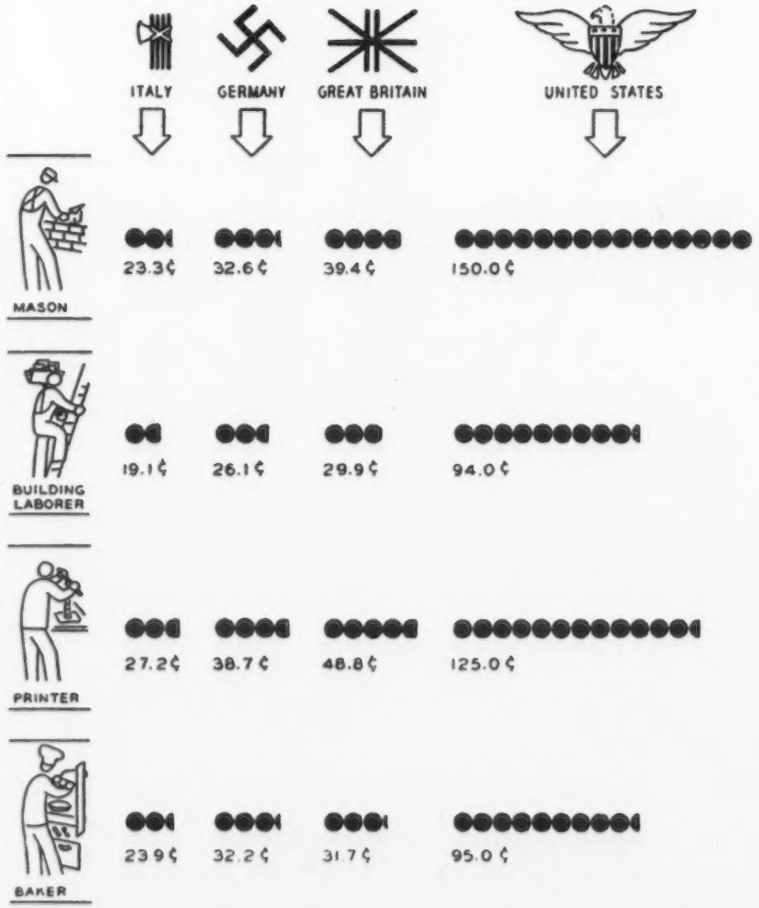
LONDON (By Mail).—The New South Wales Government has sold an 80-acre site at Port Kembla to Armco (Australia) Proprietary, Ltd., for the establishment there of a large plant for the manufacture of automobile body and other grades of high finished steel sheets. The company intends spending approximately £500,000 ($2,500,000) on the works, and during the early stages of its operations will employ about 500 men. Port Kembla is the big Australian iron producing town.

UNITED STATES LABOR CAN BUY MORE!

UNITED STATES LABOR IS PAID MORE!

UNITED STATES LABOR IS PAID MORE!

COMPARATIVE WAGE RATES OF MALE WORKERS IN SELECTED OCCUPATIONS*



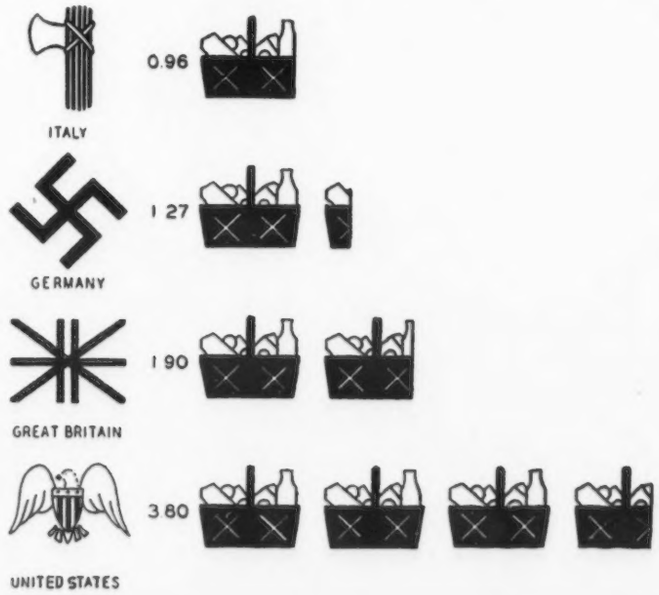
*IN REPRESENTATIVE LARGE CITIES

● DENOTES 10 CENTS

UNITED STATES LABOR CAN BUY MORE!

HOW MUCH FOOD A WORKER CAN BUY FOR ONE HOUR'S WAGES

IN TERMS OF THE AMERICAN WORKERS' MARKET BASKETS



CONTENTS OF EACH BASKET

White Bread	5.709 ozs.	Potatoes	6.487 ozs.
Rye Bread	1.229 "	Sugar	2.143 "
Flour	2.103 "	Coffee	0.359 "
Oatmeal	0.234 "	Tea	0.056 "
Butter	0.725 "	Cheese	0.175 "
Margarine	0.280 "	Milk	0.337 qts.
Lard	0.535 "	Eggs	0.665
Beef	1.467 "	Rice	0.135 ozs.
Mutton	0.082 "	Macaroni	0.163 "
Pork	0.729 "	Beans	0.135 "
Veal	0.179 "	Prunes	0.099 "
Bacon	0.334 "		

Based on the average consumption of 100 American families, a family of 2 adults and 3 children will use: 4 baskets per day; 28 baskets per week.

Based largely on International Labor Office statistics for wages and prices in important cities of each country during October, 1935.

Experiments in political economy are going on in various countries, particularly abroad. What these mean as affecting the income and purchasing power of the average wage earner is exemplified in the charts shown herewith, which are from "Labor Under the Isms," published by the Transportation Association of America.

THE IRON AGE, May 26, 1938—85

Current Metal Working Activity

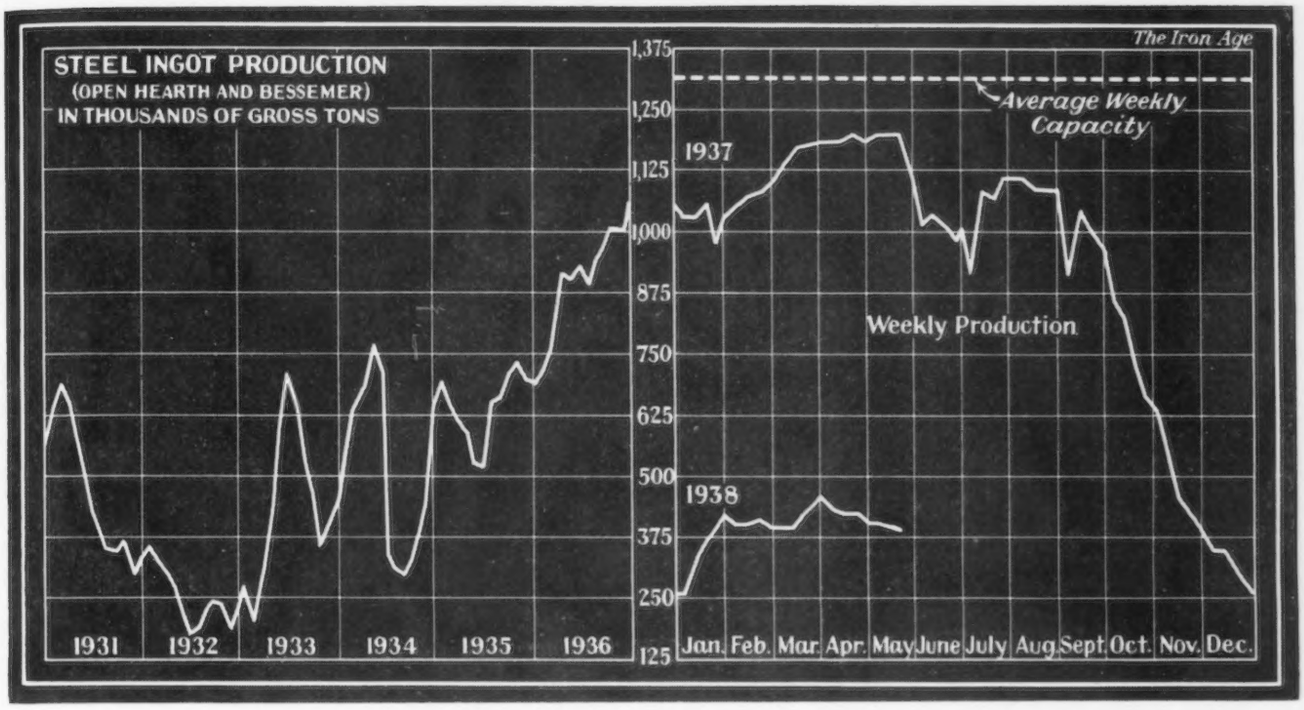
Latest Data Assembled by THE IRON AGE from Recognized Sources

	April 1938	March 1938	February 1938	March 1937	Three Months 1937	Three Months 1938
Steel Ingots: (gross tons)						
Monthly output[a]	1,925,166	2,012,406	1,703,726	5,216,243	14,351,461	5,448,896
Average weekly output[a]	448,737	454,268	425,932	1,177,481	1,115,977	423,709
Per cent of capacity[a]	33.44	33.85	31.74	89.90	85.20	31.58
Pig Iron: (gross tons)						
Monthly output[b]	1,376,141	1,452,487	1,298,268	3,459,473	9,670,191	4,179,840
Raw Materials:						
Coke output[c] (net tons)		2,772,371	2,598,186	4,849,363	13,762,576	8,250,131
Lake ore consumed[d] (gross tons)		.....	1,776,585	5,142,496	14,280,114	.....
Castings: (net tons)						
Malleable, production[e]		21,902	19,252	67,559	178,492	60,048
Malleable, orders[e]		20,556	19,557	68,502	182,759	57,189
Steel, production[e]		30,793	27,436	111,704	296,106	89,196
Steel, orders[e]		28,096	30,863	158,284	371,817	88,146
Finished Steel: (net tons)						
Trackwork shipments[a]	3,793	4,461	3,014	10,720	26,119	10,610
Fabricated shape orders[f]		83,977	54,996	206,321	461,837	218,847
Fabricated shape shipments[f]		100,956	79,568	142,995	345,125	268 287
Fabricated plate orders[e]		38,052	17,827	71,250	145,044	79,031
U. S. Steel Corp. shipments[g]		572,199	474,723	1,414,399	3,698,041	1,565,244
Ohio River steel shipments[h]	82,200	91,550	74,612	122,100	306,670	239,412
Fabricated Products:						
Automobile production[i]		238,753	202,872	519,178	1,302,108	669,369
Construction contracts[j]	$222,016‡	$226,918‡	$119,038‡	$231,246‡	$662,681	$541,428
Steel barrels shipped[e]		.....	.....	995,407	2,639,435	.....
Steel furnitura shipments[e]		.....	$1,673‡	$2,629‡	$7,066‡	.....
Steel boiler orders[e] (sq. ft.)		753,480	435,317	1,585,833	3,102,085	1,690,400
Locomotives ordered[k]	3	10	17	29	108	36
Freight cars ordered[k]	3	682	109	6,200	27,613	816
Machine tool index[l]	90.3	107.0	75.7	211.6	192.4†	100.4†
Foundry equipment index[m]	79.3	114.6	90.4	293.2	244.8†	94.4
Non-Ferrous Metals: (net tons)						
Lead shipments[n]	25,952	31,052	30,135	63,425	159,518	96,110
Lead stocks[n]	156,715	143,511	138,134	137,204	.....	.....
Zinc shipments[o]	20,806	33,528	21,540	59,635	157,815	79,999
Zinc stocks[o]	135,238	118,009	108,138	18,183	.....	.....
Tin deliveries[p] (gross tons)	3,745	4,555	4,420	9,080	24,370	14,525
Refined copper deliveries[q]	42,871	44,576	32,282	98,349	262,626	107,563
Refined copper stocks[q]	355,663	342,785	326,244	121,448	.....	.....
Exports: (gross tons)						
Total iron and steel[r]		526,883	460,640	570,551	1,063,228	1,573,817
All rolled steel[r]		160,959	144,379	186,531	412,186	493,371
Finished steel[r]		130,938	113,589	173,428	381,111	391,812
Scrap[r]		334,742	255,627	355,979	631,962	1,065,371
Imports: (gross tons)						
Total iron and steel[r]		11,827	19,589	51,802	135,596	61,047
Pig iron[r]		746	3,354	10,720	34,494	13,847
All rolled steel[r]		8,929	14,885	31,460	79,003	42,231
British Production: (gross tons)						
Pig iron[s]	661,000	714,600	693,300	680,300	1,934,700	2,169,000
Steel ingots[s]	938,000	1,115,800	1,057,600	1,109,500	3,104,300	3,254,800

† Three months' average. ‡ 000 omitted.

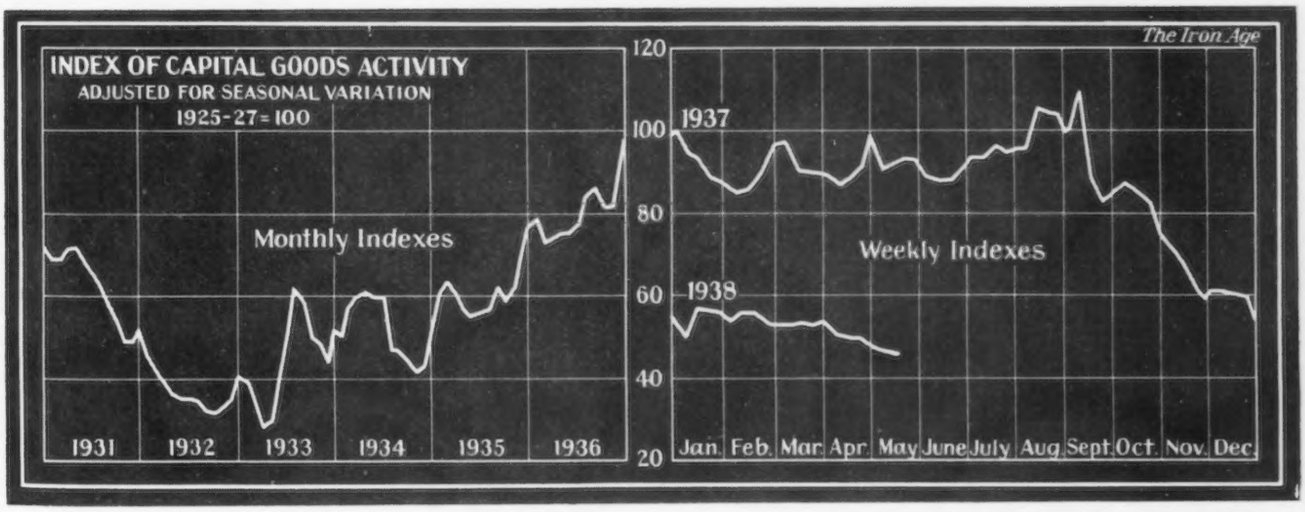
Source of data: [a] American Iron and Steel Institute; [b] THE IRON AGE; [c] Bureau of Mines; [d] Lake Superior Iron Ore Association; [e] Bureau of the Census; [f] American Institute of Steel Construction; [g] United States Steel Corp.; [h] United States Engineer, Pittsburgh; [i] Preliminary figures from Automobile Manufacturers Association—Final figures from Bureau of the Census, U. S. and Canada; [j] F. W. Dodge Corp.—37 Eastern states; [k] *Railway Age;* [l] National Machine Tool Builders Association; [m] Foundry Equipment Manufacturers Association; [n] American Bureau of Metal Statistics; [o] American Zinc Institute, Inc.; [p] New York Commodity Exchange, Inc.; [q] Copper Institute; [r] Department of Commerce; [s] British Iron and Steel Federation.

Steel Ingot Production Drops to 28 Per Cent



		Pitts-burgh	Chicago	Valleys	Phila-delphia	Cleve-land	Wheel-ing	Buffalo	Detroit	Southern	S. Ohio River	Western	St. Louis	East-ern	Aggre-gate
District Ingot Production, Per Cent of Capacity	CURRENT WEEK	22.0	28.5	24.0	26.0	16.0	54.0	21.5	19.5	48.0	40.0	30.0	37.5	10.0	**28.0**
	LAST WEEK	29.0	29.0	26.0	26.0	18.0	58.0	26.5	19.5	48.0	40.0	30.0	37.5	10.0	**30.0**

Capital Goods Activity Shows No Basic Change



BEARING out other statistical evidence to the effect that the present recession is apparently touching the bottom, THE IRON AGE index of capital goods activity for the week ended May 21 was comparatively unchanged from the previous week and there are no indications of any basic changes in the present position of the various components of the index. The only noticeable feature of the week's activity was that the precipitous decline of the index since last fall has apparently checked and current losses are in most cases limited to within the bounds of the seasonal trends.

	Week Ended May 21	Week Ended May 14	Comparable Week 1937	Comparable Week 1929
Steel ingot production[1]	37.2	38.3	118.1	128.0
Automobile production[2]	40.1	40.1	116.8	129.8
Construction contracts[3]	61.8	62.0	60.4	130.4
Forest products carloadings[4]	46.7	45.9	69.9	120.4
Production and shipments, Pittsburgh district[5]	46.9	45.6	103.1	126.1
Combined index	**46.5**	**46.4**	**93.7**	**126.9**

Sources: 1. THE IRON AGE; 2. Ward's; 3. *Engineering News-Record*; 4. Association of American Railroads; 5. University of Pittsburgh.

. . . . SUMMARY OF THE WEEK. . . .

. . . Sweeping revisions made in flat rolled classifications.

° ° °

. . . Ingot production drops to 28 per cent; steel scrap at new low.

° ° °

. . . Industry begins to look for moderate upturn by August.

SWEEPING revisions in classifications of flat rolled steel products, eliminating the inconsistencies and overlapping that have resulted from the wide adoption of the continuous mill in recent years, were the most striking feature of the third quarter price announcement issued by the Carnegie-Illinois Steel Corp., which has been followed by its principal competitor, the Bethlehem Steel Co., and some of the other independent companies.

The adjustments in flat rolled steel include the abandoning of a separate base price for No. 24 gage hot rolled annealed sheets, formerly designated as black sheets, and the adoption of one base price for all hot rolled sheets and another for cold rolled sheets replacing dual basing covering heavy and light sheets in these classifications. Hot rolled strip, which included widths up to 24 in., is confined to a maximum of 12 in., with wider sizes to be governed by sheet base prices and extras. Tin mill black plate will be sold as such only in gages of 29 and lighter; heavier gages to be on the sheet card.

Cold rolled strip steel has been reduced $2 a ton with no changes in extras. Commodity cold rolled strip, used by the automobile industry and other large consumers, will also be revised downward to conform to sheet and strip base price changes. An announcement is expected momentarily on galvanized sheets, on which there will probably be a lower base price, but with changed extras and an increase in the additions for less-carload lots and possibly the elimination of the functional discount to jobbers.

A few pig iron makers have reaffirmed current prices for the third quarter, and others are expected to take similar action. Lake Superior iron ore prices have been reaffirmed for the 1938 season.

The adoption of new base prices and extras for sheets and strip results in higher net prices on some items and lower net prices on others, the changes about balancing each other. Light gages and narrow widths are generally higher, while heavy gages and extreme widths are lower. The automobile industry, the largest user of wide sheets, will effect some savings on these sizes, which will be mostly offset by higher prices on other sizes. Parts suppliers, which mainly use narrow sheets, will find their net prices higher, while body builders may save.

Until June 30 buyers may avail themselves of either the old or new system, whichever results in a lower net price. This situation may bring about some buying for stock during June of those sizes on which savings can be temporarily effected.

The simplification of the sheet base prices has necessitated a change in the method of computing THE IRON AGE finished steel price composite. Since this price index was established, No. 24 hot rolled annealed sheets, on which there is no longer a separate base price, has been one of eight components. With its elimination, the new base price of 2.30c. for hot rolled sheets has been substituted, which results in a much lower average figure. A revision of THE IRON AGE composite price for a period of years on a comparable basis will be published in the next issue. The composite figure used this week is 2.487c. a lb.

STEEL ingot production for the country has dropped two points this week to 28 per cent of capacity. The sharpest decline was in the Pittsburgh district, which fell from 29 to 22 per cent. The neighboring Wheeling-Weirton area is off four points to 54 per cent. Chicago declined half a point, the Valleys two points, Cleveland-Lorain two points to 16 per cent, Buffalo five points to 21.5 per cent, while other districts are practically unchanged.

Scrap markets continue to reflect the unsatisfactory summer outlook for steel. No. 1 heavy melting scrap at Pittsburgh has declined 50c. a ton on sales to consumers. Chicago and Philadelphia prices are unchanged. THE IRON AGE scrap composite price is 17c. lower at $11.25.

DESPITE the discouraging current situation, the steel industry is looking for at least a moderate upturn by August. With politics and business so closely interwoven, some encouragement has been derived from the defeat of John L. Lewis' forces in Pennsylvania primaries in that a more favorable atmosphere for business is being forced by what seems to be a change in public opinion.

While there has been an upturn in work being done in Michigan tool and die shops in preparation for new automobile models, production of 1938 cars continues to taper. Railroad buying of importance has not yet made an appearance, and construction lettings of steel are following the recent subnormal pattern. The week's structural steel lettings were about 12,000 tons, with new projects of 14,000 tons in the market for bids.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	May 24, 1938	May 17, 1938	Apr. 26, 1938	May 25, 1937
Rails, heavy, at mill	$42.50	$42.50	$42.50	$42.50
Light rails, Pittsburgh	43.00	43.00	43.00	43.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	37.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	37.00
Slabs, Pittsburgh	37.00	37.00	37.00	37.00
Forging billets, Pittsburgh	43.00	43.00	43.00	43.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	47.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	2.10	2.10	2.10	2.10

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	2.45
Bars, Chicago	2.50	2.50	2.50	2.50
Bars, Cleveland	2.50	2.50	2.50	2.50
Bars, New York	2.81	2.81	2.81	2.78
Plates, Pittsburgh	2.25	2.25	2.25	2.25
Plates, Chicago	2.30	2.30	2.30	2.30
Plates, New York	2.55	2.55	2.55	2.53
Structural shapes, Pittsburgh	2.25	2.25	2.25	2.25
Structural shapes, Chicago	2.30	2.30	2.30	2.30
Structural shapes, New York	2.52	2.52	2.52	2.5025
Cold-finished bars, Pittsburgh	2.90	2.90	2.90	2.90
Hot-rolled strip, Pittsburgh	*2.30*	2.40	2.40	2.40
Cold-rolled strip, Pittsburgh	*3.10*	3.20	3.20	3.20
Sheets, galv., No. 24, P'gh	3.80	3.80	3.80	3.80
Sheets, galv., No. 24, Gary	3.90	3.90	3.90	3.90
Hot-rolled sheets, Pittsburgh	*2.30*	2.40	2.40	2.40
Hot-rolled sheets, Gary	*2.40*	2.50	2.50	2.50
Cold-rolled sheets, Pittsburgh	*3.35*	3.45	3.45	3.55
Cold-rolled sheets, Gary	*3.45*	3.55	3.55	3.65
Wire nails, Pittsburgh	2.75	2.75	2.75	2.75
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.80
Plain wire, Pittsburgh	2.90	2.90	2.90	2.90
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.95
Barbed wire, galv., P'gh	3.40	3.40	3.40	3.40
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	3.45
Tin plate, 100-lb. box, P'gh	$5.35	$5.35	$5.35	$5.35

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	May 24, 1938	May 17, 1938	Apr. 26, 1938	May 25, 1937
No. 2, fdy., Philadelphia	$25.84	$25.84	$25.84	$25.76
No. 2, Valley furnace	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti	23.89	23.89	23.89	23.69
No. 2, Birmingham†	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.	25.34	25.34	25.34	25.26
Basic, Valley furnace	23.50	23.50	23.50	23.50
Malleable, Chicago*	24.00	24.00	24.00	24.00
Malleable, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago	30.34	30.34	30.34	30.04
Ferromanganese, seab'd, carlots	102.50	102.50	102.50	102.50

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	*$11.00*	$11.50	$11.75	$18.75
Heavy melting steel, Phila.	12.00	12.00	12.75	18.25
Heavy melting steel, Ch'go	10.75	10.75	11.25	16.75
Carwheels, Chicago	12.50	12.50	13.00	19.25
Carwheels, Philadelphia	14.75	14.75	14.75	19.75
No. 1 cast, Pittsburgh	*13.25*	13.75	14.25	19.25
No. 1 cast, Philadelphia	14.25	14.25	15.25	20.25
No. 1 cast, Ch'go (net ton)	10.75	10.75	10.75	15.25
No. 1 RR. wrot., Phila.	15.25	15.25	15.25	19.75
No. 1 RR. wrot., Ch'go (net)	8.25	8.25	8.75	15.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$4.00	$4.00	$4.00	$4.60
Foundry coke, prompt	5.00	5.00	5.00	5.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	*9.00*	10.00	10.00	14.00
Lake copper, New York	*9.125*	10.125	10.125	14.12½
Tin (Straits), New York	**37.25**	36.375	37.75	56.75
Zinc, East St. Louis	4.00	4.00	4.25	6.75
Zinc, New York	4.39	4.39	4.64	7.10
Lead, St. Louis	*4.10*	4.35	4.35	5.85
Lead, New York	*4.25*	4.50	4.50	6.00
Antimony (Asiatic), N. Y.	*14.25*	14.75	15.25	14.75

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
May 24, 1938	2.487c. a Lb.	$23.25 a Gross Ton	$11.25 a Gross Ton
One week ago	See	23.25	11.42
One month ago	Note	23.25	11.92
One year ago	Below	23.25	17.92
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.	**Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.**	**Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.**

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1938					$14.00, Jan. 4	$11.25, May 24
1937	2.605c., Mar. 9	2.330c., Mar. 2	$23.25, Mar. 9	$20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 16
1936	2.330c., Dec. 28	2.084c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.130c., Oct. 1	2.124c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 23
1934	2.199c., Apr. 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., Apr. 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Feb. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., Apr. 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 17	13.08, Nov. 22

NOTE: A new method of quoting flat rolled steel products, effective May 18, creates a fundamental change which necessitates a revision of THE IRON AGE finished steel composite price. No. 24 hot rolled annealed sheets (black sheets), which have been a component of THE IRON AGE index since it was inaugurated, no longer exist as a base grade. The new hot rolled sheet base price of 2.30c., Pittsburgh, has been substituted, resulting in a considerably lower average. Comparable revisions covering a period of years will be published in the June 2 issue of THE IRON AGE.

. . . PITTSBURGH . . .

. . . Price announcements issued on all steel products except galvanized sheets and commodity cold rolled strip . . . Pig iron prices to be reaffirmed . . . Ingot output in Pittsburgh drops to 22 per cent.

PITTSBURGH, May 24.—Third quarter price announcements are all out with the exception of pig iron, commodity cold rolled strip and galvanized sheets. Information on the first two items is expected some time this week and there is also a possibility that a new revised galvanized sheet set-up will be out soon. Commodity cold rolled strip base price and extras are expected to reflect changes similar to those made recently in cold rolled sheets. Reaffirmation of pig iron prices in this district is anticipated. Cold finished carbon and alloy bar prices have been reaffirmed for third quarter delivery.

The outstanding innovation for third quarter quotations involves flat rolled products, details on which appear elsewhere. Briefly, the changes involve a realinement and adjustment in the entire flat rolled price structure in order to eliminate inconsistencies which have developed since the installation of the wide continuous strip mill.

Steel ingot output in the Pittsburgh district dropped seven points this week to 22 per cent of capacity, the largest single drop in several months. The Wheeling-Weirton district has declined four points to 54 per cent of capacity.

Pig Iron

No formal announcements on third quarter prices have been made as yet but no change is anticipated. New business is no better than a week ago and daily tonnages continue spotty and irregular.

Semi-Finished Steel

Reaffirmation of prices for third quarter has had no effect on the volume of incoming business. Orders were up slightly during the past week but these increases are similar to periodic spurts in the past.

Bars, Plates and Shapes

Reaffirmation of hot rolled bar prices is not expected to have any effect on the volume of incoming business as consumers have been purchasing only absolute necessities. Orders so far this month are running about 18 per cent behind the corresponding period a month ago. Structural inquiries and awards are more numerous than a week ago but tonnages involved are not large and publicly financed projects predominate.

Cold Finished Bars

Present prices on cold finished carbon and alloy bars have been reaffirmed for third quarter delivery. New business has improved slightly in the past few weeks but total tonnages continue unimpressive.

Tin Plate

Tin plate operations are estimated this week at between 45 and 50 per cent and incoming specifications are in slightly less volume than a week ago. Can makers continue to maintain caution in their purchases. The new tin mill black plate card covers sizes ranging in width from 12 in. to 32 in. in gages 29 and lighter. Revisions made have eliminated past inconsistencies.

Tubular Goods

Total tubular sales so far this month are about equal to the volume placed in the corresponding April period. Standard pipe orders have fallen off recently but oil-country goods is steady at recent levels. Prices are not quoted on a quarterly basis but no change in the near future is contemplated.

Wire

Total business is holding up exceptionally well because of relatively good manufacturing wire specifications. Reaffirmation of prices is not expected to influence buying to any extent. Some loose interpretations of the 80,000-lb. merchant wire classification have appeared recently.

Sheets and Strip

The new flat rolled set up announced by Carnegie-Illinois, details on which appear elsewhere, has eliminated inconsistencies in the relations between various products which have come to light since the installation of the wide strip mills. Price structure has been considerably simplified as gage and width extras have been combined. Strip which heretofore included steel up to 24 in. wide, now runs to 12 in. with the sheet card taking care of widths over this dimension. The new base prices to which the new extras are applicable are fundamental in nature in that the whole set up of extras and deductions for the different items are based on these prices. Hot rolled annealed and heavy cold rolled base classifications have been eliminated. Base price on cold rolled strip has been revised downward to conform with the new cold rolled sheet card.

Weekly Booking of Construction Steel

	Week Ended				Year to Date	
	May 24, 1938	May 17, 1938	Apr. 26, 1938	May 25, 1937	1938	1937
Fabricated structural steel awards	12,200	4,500	16,325	17,200	272,180	499,015
Fabricated plate awards	635	1,460	1,500	600	54,285	57,755
Steel sheet piling awards	3,700	0	0	345	14,125	16,870
Reinforcing bar awards	5,325	5,730	10,630	2,235	90,640	85,805
Total Lettings of Construction Steel	21,860	11,690	28,455	20,380	431,230	659,445

. . . . CHICAGO . . . .

. . . Ingot output down half a point to 28½% . . . Sellers believe an upward turn may come in 60 to 90 days . . . Pig iron prices reaffirmed for third quarter.

CHICAGO, May 24.—Ingot output eased one-half point this week to 28½ per cent of capacity, two district mills figuring in the decline.

Except for a continuing downward trend in steel orders from the farm equipment group, general conditions in this area have changed practically none in the past six weeks. Buying from the railroads and automobile makers is unimproved. Miscellaneous purchases are always in evidence but the tonnage is light. The building trade is not at all busy, although construction awards and inquiries seem to be increasing in number. Jobber sales are about even with last month, and orders are well diversified.

Many sellers believe consumption is in excess of production and point to constantly lowering inventories as proof of this assertion. Accordingly, they are looking forward to fall with great hopes, and are predicting a rise in 60 to 90 days.

Labor trouble closed the plants of the J. I. Case Co. in Rockford and the Walworth Co. in Kewanee, Ill. More than 3000 workers were kept idle by these disputes. The Case plant reopened today (Tuesday).

Scrap prices are nominal and unchanged. Heavy melting steel is quoted at $10.50 to $11.

Pig iron prices were reaffirmed this morning for third quarter by a leading district producer, and books are now open for that period.

Pig Iron

Shipments of iron are about equal to those of last month but the movement of foundry coke is slightly less. The rate of operations among the foundries is unchanged except for the farm equipment shops, where the rate is lower. Present indications are that production may be decreased shortly.

Structural Shapes and Reinforcing Bars

Construction projects are being seen in slightly greater volume but the general outlook for that industry is no better. Revision of the Chicago building code conceivably may help local conditions.

Sheets and Strip

Makers of culverts, refrigerators, washing machines, combines and ironing machines have taken small tonnages in the past week. Automobile interest still lags.

Wire and Wire Products

Only in the merchant wire products line is steel business as good as last year. The many needs and good buying power of the farmers are holding the sales of this division close to the 1937 levels, and the fall terms, to be announced June 1, are expected to bring in considerable additional tonnage during the summer. Industrial requirements for wire remain light.

Bars

Specifications from farm implement manufacturers are being received in less volume. Mill schedules are correspondingly lower because demand from motor car and railroad consumers is unimproved. Jobbers are moderately active.

Plates

New railroad equipment orders are the hope of plate mills but not much activity in this line is expected in the near future. Structural fabricating is requiring some plates but the orders are infrequent and usually small.

REINFORCING STEEL

. . . Awards of 5325 tons; 1920 tons in new projects.

AWARDS

1500 Tons, Chicago, sanitary district pumping station, to Ceco Steel Products Co., Omaha, Neb.

1300 Tons, New York, George Washington bridge approach, to Igoe Bros., Newark, N. J.

470 Tons, Palo Alto County, Iowa, state highway projects, to Laclede Steel Co., St. Louis.

375 Tons, New York, Queens-Midtown tunnel, Manhattan land section, to Seaboard Steel Products Corp., New York.

300 Tons, Chicago, Mount Greenwood outfall sewer, to Republic Steel Corp., Cleveland.

246 Tons, Rutledge, Tex., Colorado River project (Invitation 46567A), to Tennessee Coal, Iron & Railroad Co., Birmingham.

190 Tons, Herkimer County, N. Y., mostly mesh, highway project, to Wickwire Spencer Steel Co., New York.

187 Tons, Odair, Wash., Grand Coulee project, to Columbia Steel Co., Seattle.

177 Tons, Ignacio, Colo., Bureau of Reclamation (Invitation 32036A), to Colorado Fuel & Iron Co., Denver.

126 Tons, Gilroy, Cal., North Fork Dam, to San Jose Steel Co., San Jose, Cal.

124 Tons, Oakland, Cal., Glen View school addition, to W. C. Hauck & Co., San Francisco.

112 Tons, New York, approach to Bronx-Whitestone bridge, to Joseph T. Ryerson & Son, Inc., Jersey City.

100 Tons, Powell County, Mont., Nevada Creek storage project, to Bethlehem Steel Co., Bethlehem, Pa.

100 Tons, Koralli County, Mont., Bitteroot storage project, to Colorado Fuel & Iron Co., Denver.

NEW REINFORCING BAR PROJECTS

558 Tons, Cuyahoga County, Ohio, cloverleaf project near Willow; bids soon by Ohio Department of Highways.

300 Tons, Cleveland, Doanbrook sewer, also 65 tons of beams; bids soon.

175 Tons, Pocatello, Idaho, school building.

170 Tons, Ignacio, Colo., Bureau of Reclamation (Invitation 32044A); bids May 26.

169 Tons, Akron, Ohio, Wilbeth Road storm sewer; Dominic Nero low bidder on general contract.

168 Tons, Rutledge, Tex., Colorado River project (Invitation 46759A); bids May 26.

140 Tons, Pontiac, Mich., Sisters of Mercy nurses' home.

133 Tons, Charleston, Utah, Provo River project (Invitation 27518A); bids opened.

100 Tons, Springfield, Ohio, Y.M.C.A. building.

. . .BOSTON. . .

. . . Pig iron sales are few . . . Large foundries well stocked.

BOSTON, May 24.—Pig iron sales continue few and far between, and mostly in carlots to the smaller class of foundries. Large foundries, based on the current rate of melt, have plenty of iron for some time. Government and municipal orders for castings are coming into the market a little more freely.

The American Steel & Wire Co., Worcester, Mass., is operating two furnaces, the Washburn Wire Co., Phillipsdale, R. I., one 20-ton furnace, while the furnaces of American Tube & Stamping Co., Bridgeport, Conn., are out.

Electrical appliance manufacturers are hiring about a third as many workers as a year ago, and operating three days a week. The American Steel & Wire Co.'s base price on cold rolled strip is now $3.30 per 100 lb., Worcester.

Demand for cast iron pipe is fair, all things considered, but much current business is being placed privately. Pipe prices are holding at or very close to $50 a ton, base.

..GREAT BRITAIN..

. . . European political situation causes uncertainty . . . British pig iron market growing worse.

LONDON, May 24 (*By Cable*).—The obscurity of the European political situation is causing general hesitancy and uncertainty.

The Continental steel market is quiet and the immediate future is uncertain.

The Belgian delegation to the Cartel meeting this week in Rome reported that it was unable to announce unanimous support for a renewal of the Raw Steel Cartel as one Belgian works is still opposed. If the Raw Steel Cartel is renewed, formation of a Continental Hoop Strip Cartel is considered certain.

The British pig iron market is steadily growing worse and there are fears of further shutting down of six blast furnaces this week. Producers are urging the Government to give out a statement immediately regarding the proposals for the acquisition of war stock. A limit of a million tons is talked about, but nothing definite is known. Home pig iron prices left unchanged after June, but further meetings likely before then. Continental foundry pig iron is offered at 66s. f.o.b. which with 33 1/3 per cent tariff makes the price here cheaper than the British product, but there are no buyers.

Heavy steel makers are still busy but new business is slow and the outlook is obscure.

The tin plate market is dull, with small inquiry.

Export black sheets have been reduced 15s. except for special markets.

. . . .PIPE LINES. . . .

Shell Petroleum Corp., Shell Building, St. Louis, plans 6-in. welded steel pipe line from Lima, Ohio, to Toledo, about 80 miles, for gasoline transmission to new bulk storage and distributing plant to be located on Summit Street, that city, with initial tank capacity of 1,000,000 gal. Cost close to $500,000.

United States Engineer Office, Second District, New Orleans, asks bids until May 27 for 50 lengths of 20-in. inside diameter steel shore pipe, each length 17 ft. long (Circular 522).

American-Michigan Pipe Line Co., Muskegon, Mich., plans welded steel pipe line from gas fields in Isabella and Clare Counties to connection with main pipe line of Gas Corporation of Michigan, Mount Pleasant, Mich., for natural gas supply to latter company for distribution at last noted point. A steel pipe line gathering system will be installed in Sheridan and Grant Township district in Clare County, connecting with a steel pipe line gathering system to be installed in Wise and Vernon Townships, Isabella County. Booster stations will be installed. Application for permission has been made and hearing is scheduled before State Public Utilities Commission on June 16.

Houston, Tex., plans steel pipe lines for municipal natural gas distribution, including main welded steel pipe line from city limits to gas field for bulk transmission to new control station. J. M. Nagle, director, department of public works, will make surveys and estimates of cost. Preliminary estimates exceed $5,000,000 for complete project.

United States Engineer Office, Fort Peck, Mont., asks bids until June 1 for 1000 lin. ft. of steel pipe (Circular 275).

Iowa Electric Light & Power Co., Marshalltown, Iowa, has authorized 4, 6 and 8-in. pipe lines in parts of Nevada Street and Twelfth Avenue for gas distribution, about 4800 lin. ft. in all.

Lewiston, Mont., has let contract to Crane Co., Chicago, and National Tube Co., Pittsburgh for 30,500 ft. of seamless steel pipe, including fittings, on joint bid of $119,587, for water system, and to Wales-Dove-Hermiston Corp., San Francisco, for bitumastic coal tar lining for pipe. Award for valves has been made to Rensselaer Valve Co., Troy, N. Y.

East Bay Municipal Utility District, Oakland, Cal., has awarded 5000 ft. of 25-in. electric welded steel pipe to California Corrugated Culvert Co., Berkeley, Cal., and 13,600 ft. of 36-in. to Steel Tank & Pipe Co., Berkeley.

..CAST-IRON PIPE..

Boston has awarded 190 tons of 4 to 20-in. pipe and 62 tons of special fittings to Warren Foundry & Pipe Corp., Boston.

Brookline, Mass., has awarded 219 tons of 4 to 20-in. pipe to Donaldson Iron Co., Brookline.

Tampa, Fla., plans pipe lines for water system, including new 36-in. line from Hillsborough River water source to city for main supply. Cost estimated at $1,500,000. Financing will be arranged through Federal aid.

Board of District Commissioners, District Building, Washington, has let contract to Columbia Foundation Co., 2209 Channing Street, N.E., for 7490 ft. of 36-in. pipe for main water supply, at $92,211.

Quartermaster Depot, Twenty-first and Johnston Streets, Philadelphia, closes bids June 1 for soil pipe, unions, pipe fittings, valves, etc. (Circular 669-298).

Marks, Miss., asks bids until June 7 for 5000 lin. ft. of 6-in. pipe for water system; also for gate valves, fittings, etc. W. B. Nobles is town clerk.

Waukesha, Wis., closes bids May 26 on 6678 lin. ft. of 4 to 8-in. class 250 water pipe.

Two Rivers, Wis., will apply for PWA grant toward $35,000 waterworks improvements, principal item being elevated water storage tank.

Williard E. Chinn, Kelso, Wash., and associates plan pipe lines for water system at Sweet Home, Ore., including main line from Santiam River water source to town limits. Cost about $40,000. Work will begin soon.

Cynthiana, Ky., plans pipe line extensions and replacements in water system and other waterworks installation. Cost about $51,000. Financing will be arranged through Federal aid. J. S. Watkins, McClelland Building, Lexington, Ky., is consulting engineer.

Miami Beach, Fla., plans about 7000 lin. ft. of 20-in. pipe for main water line; also new 3,000,000-gal. steel reservoir; bids to be asked in June. H. H. Horn is superintendent of water department.

Carrollton, Mo., plans pipe line extensions and replacements in water system; also other waterworks installation. Cost about $165,000. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Leavenworth, Wash., plans about seven miles of pipe lines for water system in different parts of municipality; also other waterworks facilities. Fund of about $250,000 will be arranged for this and sewer system. Parker & Hill, Smith Tower Building, Seattle, are consulting engineers.

Appleton City, Mo., plans pipe line extensions in water system; also new impounding reservoir and water purification plant. Cost about $60,000. J. W. Shikles & Co., New York Life Building, Kansas City, Mo., are consulting engineers.

Fresno, Cal., plans pipe line extensions and replacements in water system, to cost about $31,650; also new 1,000,000-gal. storage tank to cost about $79,000, and other waterworks facilities. Fund of about $340,400 will be arranged for entire project. Claude H. Weekes is superintendent of water department.

Moffett Field-Palo Alto, Cal., pipe line, requiring 30,500 ft. of cement-lined 10-in. pipe, has been awarded to W. J. Tobin, Oakland, Cal. United States Pipe & Foundry Co., San Francisco, will furnish the pipe.

. . . CLEVELAND . . .

. . . Lake Superior ore prices established for season on last year's basis . . . Ingot output lower in northern Ohio districts . . . Extensive revisions in flat rolled steel classifications to be completed by new galvanized sheet price.

CLEVELAND, May 24.—The trade is slow to react to the extensive sheet and strip revisions. Current flat-rolled requirements are light. On second quarter tonnage the lowest price under either the old or new set-ups will be available to consumers. Announcement on galvanized sheets, expected momentarily, will complete the adjustments on flat-rolled products.

Lake Superior ore prices have been established for the current season at the same levels which prevailed last year.

Aggregate incoming business for steel producers so far this month is slightly behind the volume for the comparable April period. Activity in tin plate and tubular goods is stronger than for some of the other products.

In northern Ohio there are a number of public construction projects which will be up for bids in the next few weeks requiring moderate amounts of shapes, plates or reinforcing bars.

Ingot output this week in the Cleveland-Lorain District is off two points to 16 per cent while the rate for Youngstown and nearby cities is down two points to 24 per cent.

Pig Iron

Shipments so far this month are running slightly below those of the comparable April period. Operations of foundries in the Middle West show no improvement, producers of automotive castings being particularly slack. There is no sign of advance buying, and the recent price reaffirmation for third quarter will have practically no effect on purchasing over the next two or three months.

Iron Ore

Sales of Lake Superior iron ore by Cleveland ore shippers have established market prices at the same levels prevailing last season. These prices are as follows per gross ton for delivery at lower Lake docks with a guarantee of 51.50 per cent natural iron:

Old Range Bessemer	$5.25
Old Range Non-Bessemer	5.10
Mesabi Range Bessemer	5.10
Mesabi Range Non-Bessemer	4.95

These prices are on the same basis as last year but the ore shippers will absorb the increases in freight rates and handling charges instituted the latter part of last year and the first of this year, varying from 2c. to 8c. a ton, depending on the origin of the ore.

Lake Superior iron ore consumed during April amounted to 1,853,653 gross tons, compared with 1,980,182 tons in March, according to the estimate of the Lake Superior Iron Ore Association. Ore on hand at furnaces and Lake Erie docks May 1 amounted to 33,677,333 gross tons compared with 35,223,301 tons on April 1 and as against 14,632,038 gross tons on May 1 a year ago. There were 64 furnaces in blast using Lake ore on May 1 as compared with 71 on April 1 and 155 on May 1, last year.

Sheets and Strip

Completing the sweeping revisions in flat rolled products, the trade this week awaits the new set-up on galvanized sheets, which will in all probability include a lower base and the abandoning of allowances, and the announcement of necessary changes in commodity cold rolled strip. Salient points in the adjustments announced last week include the elimination of the hot rolled annealed base; reclassification of tin mill black with some of the former tin mill sizes now on the sheet card; removal of widths over 12 in. from the strip card; the combining of gage and width extras. Applying this set-up to the new base prices, it appears in certain cases the net price is higher on the lighter gages and lower on the heavier gages. However, on tonnage for second quarter the mill practice will be to give the consumer the cheapest price under either the old or new systems. To compensate for the change in the sheet base, the base price on cold rolled strip is 3.10c. Cleveland, or Pittsburgh, against 3.20c. previously; and 3.30c., Worcester, against 3.40c. previously, with no changes in extras.

Wire and Wire Products

Demand continues light with no prospects of an early upturn. Current base prices on rods, wire and wire products have been reaffirmed for the third quarter.

Bolts, Nuts and Rivets

With rods reaffirmed for third quarter, bolt, nut and rivet quotations are expected to remain steady. New orders remain at about the same volume as in April. Purchasing by the automotive industry is light.

Bars, Plates and Shapes

Three vertical lift bridges and considerable sheet piling will be required in the Cuyahoga Rivers straightening project at Cleveland, with bids on an initial 250 tons of piling to be taken about the middle of June. At an early date the Ohio Highways Department plans to call for bids on the cloverleaf grade separation at Willow, requiring 558 tons of reinforcing steel and 1337 tons of structural material. U. S. engineers will take bids June 9 on 800 tons of piling for Fairport Harbor, while the State will take bids June 3 on a bridge in Coshocton County, requiring 188 tons, and a road project in Morgan County requiring 150 tons of piling. The City of Cleveland will take bids soon on 300 tons of new billet bars for the Doanbrooke Sewer. On 1766 tons of steel pile for the City Water Department extension from Parma reservoir, Bethlehem Steel Co. is low bidder.

Westinghouse to Spend $12,000,000 This Year

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., according to A. W. Robertson, chairman, will spend approximately $12,000,000 this year on new buildings, machinery, equipment and other improvements and repairs. The program is to include $2,000,000 for Boston and East Springfield, Mass.; $6,500,000 for Pittsburgh, East Pittsburgh, South Philadelphia, Sharon and Trafford, Pa.; $600,000 for Lima, Ohio; $200,000 for Baltimore and $50,000 for Fort Wayne, Ind. A new building is to be erected at the Jersey City, N. J., elevator works and two new structures at the Emeryville, Cal., plant.

Flat Rolled Steels Reclassified; Base Prices and Extras Adjusted

UNDER date of May 18, the Carnegie-Illinois Steel Corp. issued the following announcement respecting third quarter prices:

"The Carnegie-Illinois Steel Corporation reaffirmed its present quarterly prices today on its products for delivery and consumption in the United States during the third calendar quarter of 1938 with the exception of the prices for certain flat rolled products.

"The advisability of effecting certain adjustments in the relationship between hot rolled strip, hot rolled sheets, cold rolled sheets and tin mill black plate was indicated by this company's production experience during 1937, which was the first good year since the installation of the new wide continuous mills.

"Therefore, new lists of extras and deductions have been developed. Inequalities created by the new methods of production have been corrected. In addition, in the interest of simplification, a few product names have been eliminated, gage and width extras combined, and a realinement of the sizes covered by each specific product has been effected.

"The application of the new lists of extras and deductions to second quarter base delivered prices would reflect an increase; therefore, in order to provide an equitable adjustment in the average selling price, the following carload base prices are announced today effective from date to Sept. 30, 1938, inclusive, for delivery and consumption in the United States:

	Per Lb., Base, Delivered
Hot rolled strip	2.325c., Pittsburgh 2.43c., Gary
Hot rolled sheets	2.325c., Pittsburgh 2.43c., Gary
Cold rolled sheets (primes with seconds arising)	3.375c., Pittsburgh 3.48c., Gary
Tin mill black plate	3.325c., Pittsburgh 3.43c., Gary

"The above base prices are to be used only in conjunction with the new list of extras and deductions.

"A subsequent announcement will be made covering galvanized sheets."

In the above announcement, Carnegie-Illinois uses delivered quotations, which include switching charges of 50c. a ton at Pittsburgh and 60c. a ton in the Gary-Chicago area. The actual f.o.b. prices on hot rolled strip are 2.30c., Pittsburgh, and 2.40c., Gary; on hot rolled sheets, 2.30c., Pittsburgh, and 2.40c., Gary; on cold rolled sheets, 3.35c., Pittsburgh, and 3.45c., Gary; on tin mill black plate, 3.30c., Pittsburgh, and 3.40c., Gary.

Bethlehem Steel Co. announced like prices on Monday, May 23, and other companies are expected to follow the same plan.

. . BIRMINGHAM . .

Republic banks blast furnace . . . Only six now active.

BIRMINGHAM, May 24.—Pig iron buying is limited and confined mostly to small lots. Foundries are taking iron only as needed and are avoiding stocking and forward commitments. On May 22 Republic Steel Corp. banked its only active stack, this being at Thomas. The furnace will be out until after June 10. The district's active furnace total is now reduced to six. Tennessee Coal, Iron & Railroad Co. is operating four, and Sloss-Sheffield Steel & Iron Co. and Woodward Iron Co., one each.

Steel buying is not active but there is a fair run of miscellaneous business, in small tonnages. Production remains steady, with 12 open hearth units in operation. Five are at Fairfield, three at Ensley and four at Gadsden.

The Ensley rail mill is now scheduled to close a few days after June 1.

. . . . ST. LOUIS . . . .

Agricultural implement industry using less pig iron.

ST. LOUIS, May 24.—Announcement of third quarter steel prices has had no visible effect on the market as yet.

Structural steel fabricators are getting a very small amount of work. There are no sizable private projects and only a few Government plans out.

Pig iron buying the past week was confined to a few 100-ton lots. May shipments against contracts are expected to show a falling off as compared with those of April. Reports from agricultural implement manufacturing districts tell of a further tapering off in the melt. Steel plants are also using less pig iron.

CANADA

Airplane and munitions orders expected to total over $100,000,000.

TORONTO, Ont.—Armament, munitions, guns and airplane orders are being placed in large volume in the Canadian markets by the Canadian, British and French governments with contracts closed or pending said to be well in excess of $100,000,000. This business will give employment to many thousands of Canadians and at the same time speed up operations in numerous plants throughout the country, and will also be reflected in machinery and tool purchases. The Government approved appropriations totaling $31,000,000 for the Department of Militia and Defense with a further $3,000,000 to be approved. Large airplane contracts have just been awarded, and it is stated that Canadian Car & Foundry Co. will begin construction of a huge fleet of three engined bombers for the British Air Force immediately. Other companies to share in the airplane contracts are Fairchilds, Vickers, and Norduyn companies of Montreal; De Haviland Corp., Toronto; Fleet Co., Fort Erie, Ont., and Boeing Co., Vancouver, B. C.

Canadian steel interests look for substantial further orders from Great Britain and predict that the current year will see plant operations and steel production on a level equal to that of 1937 and the high operating schedules carried well into 1939.

Pig iron production in April totaled 65,644 gross tons compared with 66,228 tons in March, a longer month. For the four months ended with April, iron output totaled 268,181 tons against 267,519 tons in the corresponding period of 1937. There now are six blast furnaces blowing, one furnace that was banked having blown in.

Steel mills are taking steel scrap as offered by local dealers, but movement continues light owing to limited supplies of heavy melting steel available. Foundries and electric furnace operators are in the market for iron grades with machinery cast going forward as fast as it can be obtained by dealers.

. . PHILADELPHIA . .

. . . Eastern Pennsylvania operations unchanged at 26 per cent . . . Price uncertainty removed by third quarter announcements, but users show little interest . . . No lift in buying expected before fall . . . Scrap inactive but steady pricewise.

PHILADELPHIA, May 24.—The week's only noteworthy development was the re-shuffling of hot rolled and cold rolled sheet and strip prices and extras, the net result being reductions in certain sizes and gages and increases in other sizes and gages. This manipulation of the base and extra lists simultaneously has created a curious situation best described as a readjustment, which in essence is a combination of a decrease, and an increase and a reaffirmation rolled into one. With this in mind, mills are committed to being fair to the consumer by taking business for shipment up to June 30 on either the old base-extra setup and new base-extra setup, whichever is the lowest for the particular gage and size of sheet or strip under consideration. Mills insist that all business after the middle of the year will go at the new base-extra schedules, whether the buyer is large or small.

Admittedly the third quarter price action has left buyers here unruffled, at least as far as ordering is concerned, although there is evidenced a mental relief arising from the general belief that any serious price weakness on a declining market would only make a bad situation worse. No seller expects any significant lift in consumer buying prior to June 30, and in fact much improvement is not looked for until late September, the increase even then not being very insistent unless railroads and autobody stamping plants throw off their lethargy.

The construction steel markets, usually seasonally busy at the present time, are actually almost dead. The only shapes award during the week involved 1000 tons for a sodium plant at Baton Rouge, La., for du Pont, awarded to Virginia Bridge Co.; and 140 tons for a Berks County, Pa., highway bridge, secured by Bethlehem. About 200 tons of plates went to Chicago Bridge & Iron Co. for Atlantic Refining Co. tanks at New Haven, Conn., Providence, R. I., and Big Flats, N. Y. Otherwise plates show no life at the moment, even though the fall demands from local shipyards appear promising. With the exception of a scattered amount of small-tonnage inquiry, reinforcing steel likewise is very sluggish, the only sizable active project being 2450 tons for the Bureau of Printing building at Washington.

Both scrap and pig iron reflect the inactivity of the steel markets. Foundry schedules on the average are hard pushed to maintain a two-day-a-week melting schedule, consequently pig iron buying is either very spotty or throttled almost entirely by the spread between iron prices and current scrap quotations. Scrap, even though inactive, continues to show the results of heavy export loadings over the past several years. There is no distress material evident here to drive quotations down. Prices for the most part are untested, although No. 1 steel is apparently steady at near $12, with not much available even at that level.

Imports

The following iron and steel imports were received here during the past week: 11 tons of wire rods, 62 tons of steel tubes, 51 tons of steel forgings and 21 tons of steel bars from Sweden.

. . SAN FRANCISCO . .

Pipe awards the principal activity on Coast.

SAN FRANCISCO, May 23.—Large steel and cast iron pipe line awards in the San Francisco Bay region were the only ripples in an otherwise becalmed market last week, but increased Bureau of Reclamation activity in the California Central Valley project is expected to afford early relief.

The East Bay Municipal Utility District, Oakland, Cal., awarded 5000 ft. of 25-in. electric welded steel pipe to the California Corrugated Culvert Co., Berkeley, Cal., and 13,600 ft. of 36-in. electric welded pipe to Steel Tank & Pipe Co., of the same city. East Bay has announced that the United States Pipe & Foundry Co., San Francisco, is low bidder on 1500 tons of cast iron pipe, and the American Cast Iron Pipe Co., San Francisco, is low bidder on 400 tons.

On a contractor's letting, the United States Pipe & Foundry Co. was awarded 30,500 ft. of 10-in. cement lined cast iron pipe for a pipe line from Palo Alto to Moffett Field, Cal.

Bids are expected to be called for within the next month on the Pitt River bridge, largest in the Bureau of Reclamation's Central Valley project. This structure will require over 10,000 tons of structural steel and a large quantity of reinforcing bars. Bids on other bridges for the project may or may not be announced at the same time as this principal structure, but steel men expect that at least one other bridge will be called for soon.

Construction bids on the Contra Costa canal, a portion of the Central Valley project, were opened last week, but materials will be bought by the Bureau of Reclamation. About 500 tons of reinforcing steel will be required for this portion of the project.

. . . CINCINNATI . . .

Sheet bookings fall off prior to price announcements.

CINCINNATI, May 24.—Imminence of price announcements is believed to have caused the decline in sheet steel bookings last week to about 25 per cent of capacity. Quotations made by Carnegie-Illinois Steel Corp. were accepted by the leading district interest and books for third quarter were opened on this basis. New business in this area is reported to be producing about the same number of orders, but tonnage is lighter. Rolling schedules are sensitive to demand, and present production is less than 30 per cent of mill capacity.

Foundry operation is off to about 20 per cent of normal activity. Except for the fair melt in machine tool foundries, plants are averaging about two heats a week. The Hamilton Coke & Iron Co. is operating only one stack and that is only partly on merchant iron.

. . . . NEW YORK. . . .

. . . Buyers have choice of old or new system in purchases of flat rolled steels until June 30, whichever results in lower net . . . Volume of orders is slightly downward.

NEW YORK, May 24.—The new set-up on flat rolled products makes it possible for the buyer to select either the old or the new system up to June 30, whichever will yield the lower net price. The new base prices and extras result in net prices that are $1 to $3 a ton higher on some items and about that much lower on other items. Significant changes in the new system are the elimination of the old familiar black sheet base (in recent years designated as No. 24 gage hot rolled annealed); the adoption of a fundamental base of 2.30c. a lb., Pittsburgh, for all hot rolled sheets, or $2 a ton lower than the base price at which No. 10 gage has been sold; also a fundamental base for cold rolled sheets, displacing the two base prices that have covered heavy and light sheets; the limitation of hot rolled strip sizes to widths of 12 in., all wider sizes being considered sheet sizes, and the restriction of sales of tin mill black plate to No. 29 and lighter gages, heavier gages to be considered as sheet sizes.

Thus far the readjustment in the flat rolled products has not affected business, except that last week while the announcement was pending buyers apparently withheld orders until they had an opportunity to digest the changes. Before the new system becomes fully effective on July 1, buyers may avail themselves of the opportunity to place orders for those sizes on which savings are possible, which may stimulate some advance ordering in June. Where prices are lower, the changes are effective at once, but where they will result in a higher net there will be no change until the third quarter.

While there has not been a great deal of change in the volume of new business in the past week, the tendency is downward. Although there is not much of a tangible basis for expectations of improvement within the near future, the trade is beginning to get the "feeling" that at least a small turn in the other direction will come after July.

Plates and Sheets

It is difficult to discern any trend in plate sales, although one of the smaller independents reports a falling off in orders from previous weeks. Except for a few large projects of a public nature involving plates, the outlook for new business is none too bright and no one industry can be singled out as being in the need of material. No action has been taken on the City scows, which will absorb 9000 tons of plates. Acquisition of United Shipyards, Inc., by Bethlehem Steel Corp. is in the final stages and will remove four repair yards from the general plate market.

Sheet sales are holding to previous levels, and no change is indicated. In a few instances, consumers had held up orders pending third quarter price announcements, but very little tonnage was involved since the new set-up automatically provided for price protection.

Pig Iron

Chateaugay Ore & Iron Corp. and Mystic Iron Co. have re-established present prices for third quarter business and the trade anticipates that the larger producers will soon take similar action. While it is undoubtedly true that a few purchasers have hesitated to buy needed iron until third quarter prices were settled, the tonnages involved are so small that the release of this business will have little effect on present market conditions. Foundry activity continues to drag along on schedules of two and three days a week with greatly reduced heats. Sellers report that sales and shipments for the current month are about on a par with April.

Reinforcing Bars

Awards in the past week, led by 1300 tons for an approach to the George Washington bridge that will be supplied by Igoe Brothers, Newark, N. J., were slightly heavier than in the two preceding weeks. All the awards were for public projects. World's Fair tonnages, which for some time have accounted for a considerable portion of each week's business, dropped off sharply in the past week. Pending tonnages are very light and mostly for public work. Prices continue to show the effect of severe competition.

. . . . BUFFALO. . . .

Slack business causes further curtailment of steel making.

BUFFALO, May 24.—A further recession in steel sales is noticeable. All lines of finished material show a slackening from previous low points.

Along with the falling off in orders, operations of open hearths and mills have been decreased. Bethlehem's Lackawanna plant, which had been operating nine open hearths, cut during the week-end to seven and apparently this will be maximum operation this week. Republic and Wickwire-Spencer continue to operate one open hearth each.

Bids have been taken on the State Cancer Hospital in Buffalo to be erected at a cost of $305,000 and the low bidder is W. F. Hendricks Co. of Schenectady. Werner Spitz of Rochester is low bidder on the 250-ton Rushville school at $206,000.

The International Railway Co. of Buffalo has announced that plans are going forward for the erection of a structure across the Niagara River gorge to replace the collapsed Fallsview bridge, and, while figures are not definite, it is believed that this structure will require between 4000 and 5000 tons of structural steel. Preliminary excavation work has been started and unless the privately-owned project is blocked by Federal moves on either side of the border, the structure will be finished in 1939.

Other structural steel projects still in the drawing board stage are the $500,000 Brockport Normal School and the $400,000 Buffalo Public School No. 18.

Warehouse business is about the same as April. Changes in prices of flat-rolled material are foreshadowed.

. . .NON-FERROUS. . .

. . . Adverse statistics and disturbed conditions abroad weaken domestic markets . . . Copper and lead quotations lowered . . . Spelter sales fall off to 1923 tons.

NEW YORK, May 24.—Unsettled conditions abroad that forced prices in London down to new lows for the present slump, together with adverse domestic statistics for April, combined to weaken all non-ferrous markets here and were directly responsible for reductions in copper and lead prices. The copper reduction of 1c. to 9c. per lb., Connecticut Valley, for electrolytic metal, was instituted late Thursday afternoon by a custom smelter and was immediately followed by all other interests. Fabricators and ingot makers have issued new price lists to conform to the new price. Domestically, sales continue to run under 1000 tons per day, the total for the month through Saturday being 13,520 tons. Export buying was reported in fairly heavy volume this morning, with about 6000 tons to be sold at prices ranging from 8.65c. to 8.72c. per lb., c.i.f., usual base ports.

The Week's Prices. Cents Per Pound for Early Delivery

	May 18	May 19	May 20	May 21	May 23	May 24
Electrolytic copper, Conn.*	10.00	9.00	9.00	9.00	9.00	9.00
Lake copper, N. Y.	10.125	9.125	9.125	9.125	9.125	9.125
Straits tin, spot, New York	36.65	36.60	36.00	....	36.50	37.25
Zinc, East St. Louis	4.00	4.00	4.00	4.00	4.00	4.00
Zinc, New York	4.39	4.39	4.39	4.39	4.39	4.39
Lead, St. Louis	4.35	4.35	4.35	4.35	4.10	4.10
Lead, New York	4.50	4.50	4.50	4.50	4.25	4.25

***Delivered Connecticut Valley; price ¼c. lower delivered in New York.**
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 14.25c. a lb., prompt, f.o.b., New York.
Antimony, American, 12.25c. per lb., prompt shipment, New York.
Quicksilver, $80.00 to $81.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 9.25c. a lb., less carload, delivered in Middle West
¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	38.00c. to 39.00c.
Tin, bar	40.00c. to 41.00c.
Copper, Lake	10.00c. to 11.00c.
Copper, electrolytic	10.00c. to 11.00c.
Copper, castings	9.50c. to 9.75c.
*Copper sheets, hot-rolled	17.125c.
*High brass sheets	15.625c.
*Seamless brass tubes	18.375c.
*Seamless copper tubes	17.625c.
*Brass rods	11.625c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.50c.
Lead, American pig	5.25c. to 6.25c.
Lead, bar	6.00c. to 6.375c.
Lead, sheets, cut	7.50c.
Antimony, Asiatic	15.50c. to 16.50c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	28.00c. to 30.00c.
Babbitt metal, commercial grade	19.00c. to 49.00c.

***These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 25 per cent allowed off for extras, except copper sheets and brass rods, on which allowance is 40 per cent.**

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	40.50c.
Tin, bar	42.50c.
Copper, Lake	10.00c. to 10.25c.
Copper, electrolytic	10.00c. to 10.25c.
Copper, castings	9.75c.
Zinc, slabs	7.00c. to 7.25c.
Lead, American pig	4.75c. to 5.00c.
Lead, bar	8.00c.
Antimony, Asiatic	17.75c. to 18.00c.
Babbitt metal, medium grade	17.50c.
Babbitt metal, high grade	44.50c.
Solder, ½ and ½	24.50c.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.50c.	7.25c.
Copper, hvy. and wire	5.75c.	6.25c.
Copper, light and bottoms	5.00c.	5.25c.
Brass, heavy	3.50c.	4.00c.
Brass light	2.50c.	3.25c.
Hvy. machine composition	5.50c.	6.00c.
No. 1 yel. brass turnings	4.00c.	5.00c.
No. 1 red brass or compos. turnings	5.25c.	5.75c.
Lead, heavy	3.50c.	3.875c.
Cast aluminum	5.50c.	6.75c.
Sheet aluminum	9.50c.	11.00c.
Zinc	1.75c.	3.00c.

Tin

After dropping as low as 36c. on Friday, Straits quotations today rose sharply to 37.25c. per lb., New York, as rumors to the effect that voting in the Malayan referendum was definitely in favor of the buffer pool began circulating through the trade. Domestic buying has been extremely light all week with carlot purchases few and far between. The London market continues quiet with cash standards at £161 and three months metal at £161 15s.

Zinc

Prime Western sales in the past week dropped to 1923 tons from 2750 tons in the previous week. Shipments last week were 2126 tons against 2426 tons in the preceding week, and undelivered stocks now stand at 24,326 tons. Prime Western quotations are unchanged at 4.39c. per lb., New York. Although for the past several weeks sellers have refused to book shipments beyond July, one seller has lately indicated willingness to accept August deliveries.

Lead

Coincidental with the issuance of the April statistics on Monday, quotations were lowered to 4.25c. per lb., New York. The April figures had a depressing effect on the market as they showed a decline in shipments of 5100 tons to 25,952 tons, while stocks rose 13,204 tons to 156,715 tons, the highest since February, 1937. Sales in the past week were down 20 per cent from the preceding week and were mostly for May deliveries. Buyers have intensified their cautious buying policies with the result that, although May's requirements are about 85 per cent covered, only 20 per cent of June's needs have been bought.

Brass and Bronze Ingots

The average prices received by members of the Non-Ferrous Ingot Metal Institute on 80-10-10 and 85-5-5-5 per cent metal during the 28-day period ended May 13 were 11.854c. and 10,083c. per lb. respectively. These compare with 11.994c. and 10.067c. in the preceding period. Deliveries in April were 2734 tons against 3305 in March.

IRON AND STEEL SCRAP

. . . Market is dull and prices weaker in many districts . . . Composite off 17c. to $11.25 based on Pittsburgh decline.

MAY 24.—Sentiment is depressed in most districts and dullness prevails except at Pittsburgh, Buffalo and St. Louis. About 3000 tons of No. 1 steel has been sold at Pittsburgh in the last ten days and the net effect has been to depress practically the entire list 50c. a ton. The Cleveland list has been affected a like amount sentimentally. Some steel has been sold at Buffalo at $11 although another mill is said to have paid $12. At St. Louis a mill has bought 10,000 tons of steel in line with present dealers' buying prices. Prices are unchanged at both Chicago and Philadelphia, and with the Pittsburgh decline on No. 1 steel the composite is brought down 17c. from last week to $11.25, $3.75 below the figure prevailing in January. Export activity is at a low ebb and Boston buying prices have been lowered $1. Prices are unchanged at New York.

Philadelphia

Broker offers of $11.50 for No. 1 steel delivered to one district mill have failed to bring out any worth-while tonnage, and there now is a tendency to better this figure to accelerate deliveries. Heavy breakable cast has been sold at near $13, whereas the remainder of the list is inactive and nominally priced. The market is in a curious state of uncertainty, with no one willing to buy and dealers certainly unwilling to commit themselves to any extent at present price levels. So little material is flowing into dealer yards that in some instances dealer quotations have been lifted, the object being to build up fair stocks for speculative purposes. Two export boats will probably be in before the middle of June, but the cargoes involved are already earmarked.

Pittsburgh

The market continues softer with sales of No. 1 steel having been made into consumption during the past week at $11.25 a ton and $11 a ton. The former figure involved about 1000 tons while the sale of $11 covered from 600 to 700 tons. In the past 10 days, around 1500 tons of No. 1 has been sold into consumption at $11.25. Two consumers will pay no more than $11 on new business. Quotations are nominal this week on No. 1 heavy melting at $10.75 to $11.25, a drop of 50c. from last week's prices. All other scrap grades are correspondingly weaker.

Chicago

A stagnant condition prevails in the local scrap market, with apparently little interest being taken either in sales or purchases. The lists of the Burlington, Rock Island and Alton are currently of attraction, but bids may not be sufficiently high to result in a sale. As there have been no sales since the $11 transaction, prices are unchanged and nominal.

Cleveland

No. 1 heavy melting steel scrap is off 50c. at Youngstown to $10.50 to $11 per ton and off 50c. at Cleveland to $10 to $10.50. Other open-hearth grades are off by the same margin. Mill buying continues conspicuously absent and uncertainty overhangs the entire scrap industry.

Buffalo

The activity in this market is somewhat less, though a mill which recently dropped its price to $11 for No. 1 heavy melting steel and $9 for No. 2 has received about 1000 tons during the past week at these prices. A large proportion of this lot was No. 1 and No. 2 bundles at $9.50 and $8 respectively. Another mill is reported to have purchased several hundred tons of No. 1 steel recently, paying $12. There is a surplus of No. 2 bundles in this market. Sales of cupola cast at $12.50, Buffalo, and $13.50, nearby points, are reported. Larger dealers are under considerable pressure to accept tonnage from the smaller dealers who are disposed to unload steel scrap.

Cincinnati

The scrap market tends duller and weaker. A few small sales during the past week failed to change dealers' bids, although quotations are still nominal. Mills refuse to consider new commitments since inventories are reported adequate.

Detroit

While sentiment in the Detroit market continues depressed, there has been little bonafide activity on which lower quotations can be based. It has been rumored that one sale of bundles was made recently to a mill on a basis of $7 a ton on track. This rumor had an obvious weakening effect on Detroit prices, but for the most part local scrap men are watching for the reaction to automotive lists which are out this week to get an indication of new price levels. Because production foundries are at a low point of activity, prices of foundry scrap are weaker, although for the most part purely nominal.

New York

Dullness prevails and the market is without feature. Export buying prices are unchanged from last week, and the future trend depends largely upon action of the European Scrap Cartel meeting in Rome on May 26. With British steel production showing a sharp decline, however, and Italian purchases being subject to credit restrictions, no new buying is anticipated at this time, although representatives of the principal exporters are all abroad. Only an occasional carload of material is being shipped into eastern Pennsylvania, and on the basis of such activity heavy breakable cast has been marked down 50c.

Boston

Prices for domestic delivered materials have been revised downward to equalize those at Pittsburgh by brokers generally. Quotations, however, mean little or nothing because of the lack of business. A boat has just left here for Japan with 7400 tons; another boat is loading 6700 tons at Mystic Wharf, and another 4000 tons at the army base. Shippers were covered on the 18,100 tons required. Japan may take additional cargoes, but nothing is booked for European delivery, consequently the export, like the domestic market, has come to a standstill, with prices off $1.

St. Louis

An otherwise dull and featureless scrap iron and steel market was enlivened during the week by the purchase of 10,000 tons of No. 2 heavy melting steel by an east side milling interest. The price paid was reported to be $10.50 per ton, and delivery will be made over the next 60 to 90 days. Dealers buying prices on this grade are $9.75 to $10. The business was split among a number of dealers. This was the first purchase by this mill in many months, and the price was substantially below that for the last preceding commitment. Not much new scrap is originating, but dealers, particularly the smaller ones, are somewhat discouraged and more disposed to sell what they have. Prices are nominally unchanged.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$10.75 to $11.25
Railroad hvy. mltng.	12.50 to 13.00
No. 2 hvy. mltng. steel	9.75 to 10.25
Scrap rails	14.00 to 14.50
Rails 3 ft. and under	16.50 to 17.00
Comp. steel	10.75 to 11.25
Hand bundled sheets	9.75 to 10.25
Hvy. steel axle turn.	9.25 to 9.75
Machine shop turn.	6.50 to 7.00
Short shov. turn.	6.50 to 7.00
Mixed bor. & turn.	6.00 to 6.50
Cast iron borings	6.00 to 6.50
Cast iron carwheels	12.50 to 13.00
Hvy. breakable cast	11.00 to 11.50
No. 1 cupola cast	13.00 to 13.50
RR. knuckles & cplrs.	14.00 to 14.50
Rail coil & leaf springs	14.50 to 15.00
Rolled steel wheels	14.50 to 15.00
Low phos. billet crops	15.00 to 15.50
Low phos. punchings	13.50 to 14.00
Low phos. plate	13.00 to 14.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$12.00
No. 2 hvy. mltng. steel	$9.50 to 10.00
Hydraulic bund., new	11.50 to 12.00
Hydraulic bund., old	8.50 to 9.00
Steel rails for rolling	16.00 to 16.50
Cast iron carwheels	14.50 to 15.00
Hvy. breakable cast	12.25 to 12.75
No. 1 cast	14.00 to 14.50
Stove plate (steel wks)	10.00 to 10.50
Railroad malleable	15.00 to 15.50
Machine shop turn	6.50
No. 1 blast furnace	6.00
Cast borings	6.00
Heavy axle turnings	8.50 to 9.00
No. 1 low phos. hvy.	16.50 to 17.00
Couplers & knuckles	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
Steel axles	20.00 to 20.50
Shafting	19.00 to 19.50
No. 1 RR. wrought	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	11.00 to 11.50
Cast borings (chem.)	10.00 to 10.50

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$10.50 to $11.00
Auto. hvy. mltng. steel alloy free	9.00 to 9.50
No. 2 auto. steel	8.50 to 9.00
Shoveling steel	10.50 to 11.00
Hydraul. comp. sheets	9.50 to 10.00
Drop forge flashings	8.25 to 8.75
No. 1 busheling	9.25 to 9.75
No. 2 busheling, old	3.75 to 4.25
Rolled carwheels	13.00 to 13.50
Railroad tires, cut	14.50 to 15.00
Railroad leaf springs	14.00 to 14.50
Steel coup. & knuckles	13.00 to 13.50
Axle turnings	10.00 to 10.50
Coil springs	15.00 to 15.50
Axle turn. (elec.)	10.00 to 10.50
Low phos. punchings	13.50 to 14.00
Low phos. plates, 12 in. and under	12.50 to 13.00
Cast iron borings	3.50 to 4.00
Short shov. turn	5.00 to 5.50
Machine shop turn	3.50 to 4.00
Rerolling rails	13.75 to 14.25
Steel rails under 3 ft.	14.00 to 14.50
Steel rails under 2 ft.	14.50 to 15.00
Angle bars, steel	12.50 to 13.00
Cast iron carwheels	12.25 to 12.75
Railroad malleable	11.75 to 12.25
Agric. malleable	10.00 to 10.50
	Per Net Ton
Iron car axles	$16.50 to $17.00
Steel car axles	15.00 to 15.50
No. 1 RR. wrought	8.00 to 8.50
No. 2 RR. wrought	9.25 to 9.75
Locomotive tires	14.25 to 14.75
Pipes and flues	9.75 to 8.25
No. 1 machinery cast	10.50 to 11.00
Clean auto. cast	9.50 to 10.00
No. 1 railroad cast	9.75 to 10.25
No. 1 agric. cast	9.50 to 10.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$10.50 to $11.00
Hydraulic bundles	10.00 to 10.50
Machine shop turn	7.00 to 7.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$10.00 to $10.50
No. 2 hvy. mltng. steel	9.00 to 9.50
Comp. sheet steel	9.50 to 10.00
Light bund. stampings	7.00 to 7.50
Drop forge flashings	8.50 to 9.00
Machine shop turn	5.00 to 5.50
Short shov. turn	5.50 to 6.00
No. 1 busheling	8.50 to 9.00
Steel axle turnings	8.00 to 8.50
Low phos. billet and bloom crops	17.00 to 17.50
Cast iron borings	5.00 to 5.50
Mixed bor. & turn	5.00 to 5.50
No. 2 busheling	5.00 to 5.50
No. 1 cast	14.00 to 14.50
Railroad grate bars	6.50 to 7.00
Stove plate	6.00 to 6.50
Rails under 3 ft.	16.00 to 16.50
Rails for rolling	14.00 to 14.50
Railroad malleable	13.00 to 13.50
Cast iron carwheels	13.00 to 13.50

BUFFALO

No. 1 hvy. mltng. steel	$10.50 to $11.00
No. 2 hvy. mltng. steel	8.50 to 9.00
Scrap rails	12.00 to 12.50
New hvy. b'ndled sheets	9.00 to 9.50
Old hydraul. bundles	7.50 to 8.00
Drop forge flashings	8.50 to 9.00
No. 1 busheling	8.50 to 9.00
Hvy. axle turnings	8.50 to 9.00
Machine shop turn	4.50 to 5.00
Knuckles & Couplers	14.00 to 14.50
Coil & leaf springs	14.00 to 14.50
Rolled steel wheels	14.00 to 14.50
Low phos. billet crops	15.00 to 15.50
Shov. turnings	6.00 to 6.50
Mixed bor. & turn	4.50 to 5.00
Cast iron borings	4.50 to 5.00
Steel car axles	14.00 to 14.50
No. 1 machinery cast	13.00 to 13.50
No. 1 cupola cast	12.00 to 12.50
Stove plate	10.50 to 11.00
Steel rails under 3 ft.	15.00 to 15.50
Cast iron carwheels	12.00 to 12.50
Railroad malleable	11.50 to 12.00
Chemical borings	7.50 to 8.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	$10.25 to $10.75
No. 1 hvy. melting	10.25 to 10.75
No. 2 hvy. melting	9.75 to 10.00
No. 1 locomotive tires	11.50 to 12.00
Misc. stand. sec. rails	11.50 to 12.00
Railroad springs	13.00 to 13.50
Bundled sheets	5.50 to 6.00
No. 1 busheling	7.00 to 7.50
Cast bor. & turn	2.50 to 3.00
Machine shop turn	2.50 to 3.00
Heavy turnings	8.00 to 8.50
Rails for rolling	13.00 to 13.50
Steel car axles	17.00 to 17.50
Iron car axles	19.50 to 20.00
No. 1 RR. wrought	7.50 to 8.00
No. 2 RR. wrought	10.00 to 10.50
Steel rails under 3 ft.	13.00 to 13.50
Steel angle bars	11.50 to 12.00
Cast iron carwheels	11.50 to 12.00
No. 1 machinery cast	11.00 to 11.50
Railroad malleable	10.50 to 11.00
No. 1 railroad cast	10.00 to 10.50
Stove plate	6.50 to 7.00
Agricul. malleable	9.00 to 9.50
Grate bars	6.50 to 7.00
Brake shoes	6.50 to 7.00

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel	$8.00 to $8.50
No. 2 hvy. mltng. steel	6.00 to 6.50
Scrap rails for mltng.	12.75 to 13.25
Loose sheet clippings	3.50 to 4.00
Hydrau. b'ndled sheets	7.50 to 8.00
Cast iron borings	2.00 to 2.50
Machine shop turn	2.50 to 3.00
No. 1 busheling	6.25 to 6.75
No. 2 busheling	1.50 to 2.00
Rails for rolling	14.75 to 15.25
No. 1 locomotive tires	11.50 to 12.00
Short rails	15.25 to 15.75
Cast iron carwheels	10.00 to 10.50
No. 1 machinery cast	10.00 to 10.50
No. 1 railroad cast	8.50 to 9.00
Burnt cast	5.00 to 5.50
Stove plate	5.00 to 5.50
Agricul. malleable	9.25 to 9.75
Railroad malleable	11.25 to 11.75
Mixed hvy. cast	6.75 to 7.25

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel	$11.50 to $12.00
Scrap steel rails	14.00 to 14.50
Short shov. turnings	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought	10.00
Rails for rolling	15.00 to 16.00
No. 1 cast	14.00 to 16.50
Tramcar wheels	14.00 to 15.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	$6.50 to $7.00
No. 2 hvy. mltng. steel	5.50 to 6.00
Borings and turnings	3.00 to 3.50
Long turnings	2.75 to 3.25
Short shov. turnings	3.50 to 4.00
No. 1 machinery cast	11.50 to 12.00
Automotive cast	11.50 to 12.00
Hvy. breakable cast	9.00 to 9.50
Hydraul. comp. sheets	7.00 to 7.50
Stove plate	6.75 to 7.25
New factory bushel	6.00 to 6.50
Old No. 2 busheling	2.00 to 2.50
Sheet clippings	4.00 to 4.50
Flashings	5.50 to 6.00
Low phos. plate scrap	7.50 to 8.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel	$7.75 to $8.00
No. 2 hvy. mltng. steel	5.75 to 6.00
Hvy. breakable cast	8.00 to 8.50
No. 1 machinery cast	10.00 to 10.50
No. 2 cast	7.00 to 7.50
Stove plate	6.00 to 6.50
Steel car axles	20.00 to 20.50
Shafting	15.00 to 15.50
No. 1 RR. wrought	11.00 to 11.50
No. 1 wrought long	9.50 to 10.00
Spec. iron & steel pipe	8.50 to 9.00
Rails for rolling	16.00 to 16.50
Clean steel turnings*	2.50 to 3.00
Cast borings*	2.50 to 3.00
No. 1 blast furnace	2.50 to 3.00
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	4.50 to 5.00
Light iron	3.00 to 3.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast	$14.00 to $15.00
No. 2 cast	11.50 to 12.00

*$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	$10.00
Scrap rails	10.00
No. 2 steel	9.00
Breakable cast	7.00
Machine shop turn.	1.45
Mixed bor. & turn.	1.25
Bun. skeleton long	4.25 to 4.35
Shafting	13.00
Cast bor. chemical	5.50
Per gross ton delivered consumers' yards:	
Textile cast	$12.00 to $12.50
No. 1 machine cast	12.00 to 12.50

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$11.65 to $12.15
No. 2 hvy. mltng. steel	10.65 to 11.15

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel	$10.50	$9.50
No. 2 hvy. mltng. steel	9.50	8.50
Mixed dealers steel	8.50	7.50
Scrap pipe	8.50	7.50
Steel turnings	7.50	7.00
Cast borings	8.50	7.50
Machinery cast	15.00	14.00
Dealers cast	13.00	12.00
Stove plate	11.00	10.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel	$8.50 to $9.50
No. 2 hvy. mltng. steel	7.00 to 8.00
No. 2 cast	7.00
Stove plate	6.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel	$10.00
No. 2 hvy. mltng. steel	9.00
Rails (scrap)	10.00
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel	Nominal
No. 2 hvy. mltng. steel	Nominal

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

	Per Gross Ton
Rerolling	$37.00
Forging quality	43.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$37.00

Skelp

Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	2.10c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Gross Ton
Pittsburgh or Cleveland	$47.00
Chicago, Youngstown or Anderson, Ind.	48.00
Worcester, Mass.	49.00
Birmingham	50.00
San Francisco	56.00
Galveston	53.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

SOFT STEEL BARS

	Base per Lb.
Pittsburgh	2.45c.
Chicago or Gary	2.50c.
Duluth	2.60c.
Detroit	2.60c.
Cleveland	2.50c.
Buffalo	2.55c.
Philadelphia	2.77c.
New York	2.81c.
Birmingham	2.60c.
On cars dock Gulf ports	2.85c.
On cars dock Pacific ports	3.00c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh	2.30c.
Cleveland, Chicago, Gary or Moline, Ill.	2.35c.
Buffalo	2.40c.
Birmingham	2.45c.
On cars dock Gulf ports	2.70c.
On cars dock Pacific ports	2.85c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh	2.45c.
Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.50c.
Detroit	2.60c.
On cars dock Gulf ports	2.85c.
On cars dock Pacific ports	2.95c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh	2.30c.
Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.35c.
On cars dock Gulf ports	2.70c.
On cars dock Pacific ports	2.80c.

IRON BARS

Chicago	2.40c.
Pittsburgh (refined)	3.60c.

COLD FINISHED BARS AND SHAFTING*

	Base Per Lb.
Pittsburgh	2.90c.
Cleveland, Chicago and Gary	2.95c.
Buffalo	3.00c.
Detroit	2.95c.

* In quantities of 10,000 to 19,999 lb.

PLATES

	Base Per Lb.
Pittsburgh	2.25c.
Chicago or Gary	2.30c.
Cleveland	2.45c.
Coatesville or Spar. Pt.	2.35c.
Philadelphia	2.445c.
New York	2.55c.
Birmingham	2.40c.
On cars dock Gulf ports	2.65c.
On cars dock Pacific ports	2.80c.
Wrought iron plates, P't'g	3.80c.

FLOOR PLATES

Pittsburgh	3.50c.
Chicago	3.55c.
Coatesville	3.60c.
On cars dock Gulf ports	3.90c.
On cars dock Pacific ports	4.05c.

STRUCTURAL SHAPES

	Base per Lb.
Pittsburgh	2.25c.
Chicago	2.30c.
Cleveland	2.45c.
Buffalo or Bethlehem	2.35c.
Philadelphia	2.465c.
New York	2.52c.
Birmingham (standard)	2.40c.
On cars dock Gulf ports	2.65c.
On cars dock Pacific ports	2.80c.

STEEL SHEET PILING

	Base per Lb.
Pittsburgh	2.60c.
Chicago or Buffalo	2.70c.
On cars dock Gulf or Pacific Coast ports	.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$42.50
Angle bars, per 100 lb	2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton	$43.00
Light rails (from rail steel) per gross ton	42.00

	Base per Lb.
Spikes	3.15c.
Tie plates, steel	2.30c.
Tie plates, Pacific Coast ports	2.40c.
Track bolts, to steam railroads	4.35c.
Track bolts, to jobbers, all sizes (per 100 counts)	65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

NOTE: Following prices superseded by new base quotations of 2.30c., Pittsburgh, and 2.40c., Gary, on hot rolled sheets; 3.35c., Pittsburgh, and 3.45c., Gary, on cold rolled sheets, subject to new list of extras issued May 18. Until June 30 whichever set of base prices and extras yields lower net will apply.

Hot Rolled, 10 Gage

	Base per Lb.
Pittsburgh	2.40c.
Gary	2.50c.
Detroit	2.60c.
Philadelphia	2.72c.
Granite City	2.60c.
Birmingham	2.55c.
On cars dock Pacific ports	2.95c.
Wrought iron, Pittsburgh	4.25c.

Hot Rolled Annealed, 24 Gage

Pittsburgh	3.15c.
Gary	3.25c.
Detroit	3.35c.
Philadelphia	3.47c.
Granite City	3.35c.
Birmingham	3.30c.
On cars dock Pacific ports	3.80c.
Wrought iron, Pittsburgh	5.15c.

Heavy Cold Rolled, 10 Gage*

Pittsburgh	3.00c.
Gary	3.10c.
Detroit	3.20c.
Philadelphia	3.32c.
Granite City	3.20c.
Birmingham	3.15c.
On cars dock Pacific ports	3.60c.

Light Cold Rolled, 20 Gage*

Pittsburgh	3.45c.
Gary	3.55c.
Detroit	3.65c.
Philadelphia	3.77c.
Granite City	3.65c.
Birmingham	3.60c.
On cars dock Pacific ports	4.00c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

Galvanized Sheets, 24 Gage

Pittsburgh	3.80c.
Gary	3.90c.
Philadelphia	4.12c.
Granite City	4.00c.
Birmingham	3.95c.
On cars dock Pacific ports	4.40c.
Wrought iron, Pittsburgh	6.10c.

Electrical Sheets

(*F.o.b. Pittsburgh*)

	Base per Lb
Field grade	3.35c.
Armature	3.70c.
Electrical	4.20c.
Special Motor	5.10c.
Special Dynamo	5.80c.
Transformer	6.30c.
Transformer Special	7.30c.
Transformer Extra Special	7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot rolled, annealed sheets with few exceptions.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	4.10c.
F.o.b. Gary	4.20c.
F.o.b. cars dock Pacific ports	4.80c.

Vitreous Enameling Stock, 20 Gage

Pittsburgh	3.50c.
Gary	3.60c.
Granite City	3.70c.
On cars dock Pacific ports	4.10c.

TIN MILL PRODUCTS

NOTE: Base prices for third quarter unchanged, but will apply only to 29 gage and lighter; all other to be governed by sheet base and extras.

Black Plate, 28 Gage

Pittsburgh	3.30c.
Gary	3.40c.
Granite City	3.50c.
On cars dock Pacific ports, boxed	4.175c.

Tin Plate

	Base per Box
Standard cokes, Pittsburgh	$5.35
Standard cokes, Gary	5.45
Standard cokes, Granite City	5.55

Special Coated Manufacturing Ternes

	Base per Box
Pittsburgh	$4.65
Gary	4.75
Granite City	4.85

Roofing Terne Plate

(*F.o.b. Pittsburgh*)

(Per Package, 112 sheets, 20 x 28 in.)	
8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

HOT ROLLED STRIP

NOTE: Following prices superseded by new base prices of 2.30c., Pittsburgh, and 2.40c., Gary, subject to new list of extras issued May 18, which provide that base shall apply to strip 12 in. and under; all other to be governed by sheet base and extras. Until June 30 either old or new method may be used.

(*Widths up to 24 in.*)

	Base per Lb
Pittsburgh	2.40c.
Chicago	2.50c.
Detroit	2.60c.
Granite City	2.60c.
Birmingham	2.55c.

Cooperage Stock

Pittsburgh	2.50c.
Chicago	2.60c.

COLD ROLLED STRIP*

	Base per Lb
Pittsburgh	3.10c.
Cleveland	3.10c.
Chicago	3.30c.
Worcester	3.30c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

No. 14, Pittsb'gh or Cleveland	3.35c.
No. 14, Worcester	3.75c.
No. 20, Pittsb'gh or Cleveland	3.75c.
No. 20, Worcester	4.15c.

COLD ROLLED SPRING STEEL

		Pittsburgh and Cleveland	Worcester
Carbon	0.25-0.50%	3.20c.	3.40c.
Carbon	.51- .75	4.45c.	4.65c.
Carbon	.76-1.00	6.30c.	6.50c.
Carbon	Over 1.00	8.50c.	8.70c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Per Lb.
Bright wire	2.90c.
Galvanized wire	2.95c.
Spring wire	3.50c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $3 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	$2.75
Smooth coated nails	2.75
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	$3.15
Galvanized fence wire	3.55
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barbless wire	3.40
Woven wire fence, base column.	74
Single loop bale ties, base col...	63

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh, except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton over Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel			*Wrought Iron*		
In.	Black	Galv.	In.	Black	Galv.
⅛	..52	31	¼ & ⅜	+13	+35
¼ to ⅜	..55	38½	½	..20	1½
½	..59½	49	¾	..26	8
¾	..62½	53	1 & 1¼	..30	14
1 to 3	..64½	55½	1½	..34	16½
			2	..33½	16

Lap Weld

2	..57	47½	2	..26½	10
2½ & 3	..60	50½	2½ to 3½	27½	12½
3½ to 6	..62	52½	4	..29½	16
7 & 8	..61	50½	4½ to 8.	28½	15
9 & 10	..60½	50	9 to 12	..24½	10
11 & 12	..59½	49			

Butt Weld, extra strong, plain ends

⅛	..50½	36½	¼ & ⅜	+14	+48
¼ to ⅜	..52½	40½	½	..21	4
½	..57½	48½	¾	..27	10
¾	..61½	52½	1 to 2	..34	17½
1 to 3	..63	55			

Lap Weld, extra strong, plain ends

2	..55	46½	2	..29½	13½
2½ & 3	..59	50½	2½ to 4	..35	20½
3½ to 6	..62½	54	4½ to 6	..33½	19
7 & 8	..61½	54	7 & 8	..34½	19½
9 & 10	..60½	50	9 to 12	..28	15½
11 & 12	..59½	49			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 9.46	$ 8.41
1¼ in. o.d.	13 B.W.G.	11.21	9.96
1½ in. .od.	13 B.W.G.	12.38	11.00
1¾ in. o.d.	13 B.W.G.	14.09	12.51
2 in. o.d.	13 B.W.G.	15.78	14.02
2¼ in. o.d.	13 B.W.G.	17.60	15.63
2¼ in. o.d.	12 B.W.G.	19.37	17.21
2½ in. o.d.	12 B.W.G.	21.22	18.85
2¾ in. o.d.	12 B.W.G.	22.49	19.98
2 in. o.d.	12 B.W.G.	23.60	20.97
4½ in. o.d.	10 B.W.G.	45.19	40.15
3½ in. o.d.	11 B.W.G.	29.79	26.47
4 in. o.d.	10 B.W.G.	36.96	32.83
5 in. o.d.	9 B.W.G.	56.71	50.38
6 in. o.d.	7 B.W.G.	87.07	77.35

Extra for less-carload quantities:

40,000 lb. or ft. or over						Base
30,000	lb. or ft.	to	39,999	lb. or ft.		5%
20,000	lb. or ft.	to	29,999	lb. or ft.		10%
10,000	lb. or ft.	to	19,999	lb. or ft.		20%
5,000	lb. or ft.	to	9,999	lb. or ft.		30%
2,000	lb. or ft.	to	4,999	lb. or ft.		45%
Under 2,000 lb. or ft.						65%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago.	$55.00
6-in. and larger, del'd New York	53.00
*6-in. and larger, Birmingham.	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	56.00
F.o.b. dock, Seattle	56.00
4-in. f.o.b. dock, San Francisco or Los Angeles	59.00
F.o.b. dock, Seattle	56.00

Class "A" and gas pipe, $3 extra 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $46, Birmingham, and $54 delivered Chicago and 4-in. pipe, $49, Birmingham, and $58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. & 6 in. and smaller	65 and 5*
Larger and longer up to 1 in.	60 and 10*
1⅛ in. and larger	60 and 5*
Lag bolts	60 and 10
Plow bolts, Nos. 1, 2, 3 and 7	65 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
½ in. and smaller	65
9/16 in. to 1 in. inclusive	60 and 5
1⅛ in. and larger	60

* Less carload lots and less than full container quantity. Less carloads lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon units, U.S.S. and S.A.E.:	
½ in. and smaller	60 and 10
9/16 in. to 1 in. inclusive	60 and 5
⅛ in. and larger	60
Stove bolts in packages, nuts attached	70
Stove bolts in packages, with nuts separate	70 and 10
Stove bolts in bulk	80

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.60
F.o.b. Chicago or Birmingham	3.70

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	65 and 5
F.o.b. Cleveland	65 and 5
F.o.b. Chicago and Birmingham	65 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	70 and 5
Upset set screws, cup and oval points	80 and 5
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	3.00c.
Delivered, Detroit	3.15c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
200 (½% Nickel)	$0.35
2100 (1½% Nickel)	0.75
2300 (3½ Nickel)	1.55
2500 (5% nickel)	$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel-molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, vents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	£20 Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth	£11
Beams, open-hearth	£10 12s. 6d.
Channels, open-hearth	£10 17s. 6d.
Angles, open-hearth	£10 12s. 6d.
Black sheets, No. 24 gage	£13 5s.
Galvanized sheets, No. 24 gage	£16 15s.

CONTINENTAL

Per Gross Ton, Gold £, f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate ¼ in. and up	£6 7s.
Plate 3/16 in. and 5 mm.	£6 13s.
Sheet, ⅛ in.	£7 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 15s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.50
Delivered Newark or Jersey City	26.53
Delivered Philadelphia	25.84
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
Delivered Cincinnati	24.44
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered, San Francisco, Los Angeles or Seattle	26.95
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$25.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.61
Delivered Canton, Ohio	24.89
Delivered Mansfield, Ohio	25.44
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.53
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.00
Delivered Cincinnati	25.61
Delivered Canton, Ohio	25.89
Delivered Mansfield, Ohio	26.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$28.50

Gray Forge

Valley or Pittsburgh furnace	$23.50

Charcoal

Lake Superior furnace	$27.00
Delivered Chicago	30.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $102.50

Spiegeleisen

Per Gross Ton Furnace

Domestic 19 to 21%	$33.00
F.o.b. New Orleans	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50% $33.50

For each additional 0.50% silicon up to 17%, 50c. per ton is added.

Manganese 2 to 3%, $1 per ton additional. For each unit of manganese over 3%, $1 per ton additional. Phosphorus 0.75% or over, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50% $27.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	$101.50*
2.50% carbon	106.50*
2% carbon	111.50*
1% carbon	121.50*

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally	$2.00
Ferrotungsten, lots of 500 lbs. nominally	2.05
Ferrotungsten, smaller lots, nominally	2.10
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.

*Spot prices are $5 per ton higher
†Spot prices are 10c. per lb. of contained element higher

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Messabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron.	Nominally 17 to 18c.
Iron, basic or foundry, Swedish, aver. 65% iron.	Nominally 15c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	45c.
Man., African, Indian, 44-48%	40c.
Man., African, Indian, 49-51%	Nominal
Man., Brazilian, 46 to 48½%	Nominally 40c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$17.00
Tungsten, domestic, scheelite delivered	$16.00 to $19.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	$16.00
Rhodesian, 45%	22.00
Rhodesian, 48%	25.50
Turkish, 48-49%	25.00 to $26.00
Turkish, 45-46%	23.50 to 24.00
Turkish, 44%	19.00 to 19.50
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	$25.50 to $26.50
48-49%	25.50 to 26.00

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$18.00 to $19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	4.75c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	4.75c.
Del'd Ch'go, No. 3 industrial	4.15c.
Del'd Ch'go, No. 5 industrial	4.00c.
Del'd Cleve'd, No. 3 distillate	5.50c.
Del'd Cleve'd, No. 4 industrial	5.25c.
Del'd Cleve'd, No. 5 industrial	3.50c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$4.00 to $4.25
Furnace, f.o.b. Connellsville, Prompt	5.00 to 6.25
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	11.05
Foundry, by-product, delivered Cincinnati	10.50
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

FABRICATED STEEL

. . . Lettings advance to 12,200 tons from 4500 tons last week . . . New projects in better volume at 13,965 tons . . . Plate awards only 635 tons.

NORTH ATLANTIC STATES

AWARDS

1100 Tons, New York, Italian pavilion, World's Fair, to Bethlehem Steel Co., Bethlehem, Pa.

865 Tons, Queens, N. Y., 18 apartment houses, 65th Avenue and 65th Road, to Goodstein Iron & Steel Co., New York.

800 Tons, New York, Belgian building, World's Fair, to Ateliers de Braine-LeConte, Belgium.

800 Tons, New York, World's Fair building, Petroleum Industry, to Bethlehem Steel Co., Bethlehem, Pa.

500 Tons, North Kingston, R. I., State bridge, to Wisconsin Bridge & Iron Co., Milwaukee.

410 Tons, Marcus Hook, Pa., and Toledo, Ohio, treater and cracked heater buildings, Sun Oil Co., 210 tons to Belmont Iron Works, Philadelphia; 210 tons to Pittsburgh Bridge & Iron Co., Pittsburgh.

325 Tons, Burt, N. Y., State bridge to Bethlehem Steel Co., Bethlehem, Pa.

285 Tons, Buffalo, apartment building, to R. S. McMannus Steel Construction Co., Buffalo.

265 Tons, Waterbury, Conn., press building, Eastern Color Printing Co., to Bethlehem Fabricators, Inc., Bethlehem, Pa.

175 Tons, New York, 238th Street bridge, to American Bridge Co., Pittsburgh.

140 Tons, Jamaica, Vt., Bondville bridge, to Vermont Structural Steel Co., Burlington, Vt.

130 Tons, Buffalo, Niagara Street beam spans, to Carnegie-Illinois Steel Corp., Pittsburgh.

115 Tons, Ely, Vt., Comstock bridge, to American Bridge Co., Pittsburgh.

THE SOUTH

1010 Tons, Baton Rouge, La., sodium plant for E. I. du Pont de Nemours & Co., to Virginia Bridge Co., Roanoke, Va.

570 Tons, Fondren, Tex., Humble Pipe Line Co., roof supports and tanks, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

230 Tons, Clarke County, Miss., bridge, to Stupp Brothers Bridge & Iron Co., St. Louis.

160 Tons, Philippi, W. Va., bridge, to Ingalls Iron Works Co., Birmingham.

135 Tons, Winchester, Ky., additions to schools, to Bedford Foundry & Machine Co., Bedford, Ind.

CENTRAL STATES

1500 Tons, Kalamazoo, power house for Consumers Power Co., to American Bridge Co., Pittsburgh.

1285 Tons, Lacon, Ill., bridge, to Illinois Steel Bridge Co., Jacksonville, Ill.

310 Tons, Town of Lake, Milwaukee County, Wis., 1,000,000-gal. water tank, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

240 Tons, Iowa City, Iowa, high school, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

200 Tons, Knightstown, Ind., bridge, to Pan American Bridge Co., Newcastle, Ind.

180 Tons, Green Bay, Wis., Northern Paper Mills boiler plant, to Worden-Allen Co., Milwaukee.

132 Tons, Buckskin, Ind., State bridge, to Vincennes Bridge Co., Vincennes, Ind.

115 Tons, Green Bay, Wis., Baird Street bridge, to Wisconsin Bridge & Iron Co., Milwaukee.

105 Tons, Fort Wayne, Ind., high school, to Hugh J. Baker & Co., Indianapolis.

100 Tons, Dunreith, Ind., bridge, to Central States Bridge & Structural Co., Indianapolis.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

4000 Tons, Niagara Falls, N. Y., bridge across Niagara River for International Railway Co. of Buffalo; Montserrat & Pratley, Montreal, and Modjeski & Martin, Philadelphia, are engineers.

2300 Tons, New York, World's Fair building, French Government.

360 Tons, New York, World's Fair building, Westinghouse Electric & Mfg. Co.

300 Tons, New York, curbing for United States Treasury Department.

240 Tons, Schenectady, N. Y., service building, New York Power & Light Co.

180 Tons, Albany, N. Y., school building, Christian Brothers Academy.

175 Tons, New York, World's Fair building, National Cash Register Co.

150 Tons, Essex County, N. Y., State highway bridge RC-3959.

150 Tons, Cattauraugus County, N. Y., state highway bridge RC-3956.

135 Tons, New York, World's Fair building, Beechnut Packing Co.

100 Tons, Milbridge, Me., State bridge.

THE SOUTH

650 Tons, Goldthwaite, Tex., bridge and mill; bids in.

370 Tons, Murfreesboro, Tenn., veteran's administration building.

300 Tons, Houston, Tex., extension to power company plant.

190 Tons, Cynthiana, Ky., State bridge over Licking River.

CENTRAL STATES

2000 Tons, Omaha, Neb., Union Pacific Railroad bridges to replace those destroyed by southern California flood; bids May 26.

1350 Tons, Cuyahoga County, Ohio, cloverleaf project near Willow; bids soon by Ohio Department of Highways.

200 Tons, Jefferson County, Wis., State subway.

188 Tons, Coshocton County, Ohio, State bridge, project No. 24; bids June 3.

130 Tons, Burlington, Iowa, school building.

WESTERN STATES

600 Tons, Tejunga, Wash., bridge No. 465.31 for Southern Pacific Co.

425 Tons, Fort Peck Dam, Mont., stop logs and lifting beams.

200 Tons, Los Angeles, tunnel support ribs for Metropolitan Water District; bids opened.

190 Tons, Shelby, Mont., State overhead crossing.

165 Tons, Shelby, Mont., overpass, Great Northern tracks (FAGM 243-D1); bids May 26.

150 Tons, Portland, Ore., overpass (WPGS 285-B); bids June 2.

115 Tons, Basalt, Colo., highway work (PWA 804-D, Project 2012-A); bids June 2.

FABRICATED PLATES

AWARDS

315 Tons, Akron, Ohio, standpipe, to Chicago Bridge & Iron Works, Chicago.

180 Tons, New Haven, Conn., and Providence, R. I., tanks for Atlantic Refining Co., to Chicago Bridge & Iron Works, Chicago.

140 Tons, Town of Lake, Milwaukee County, Wis., 1,000,000 elevated water tank, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

NEW PROJECTS

1766 Tons, Cleveland, city water department extension from Parma Reservoir; Bethlehem Steel Co., Bethlehem, Pa., low bidder.

SHEET PILING

AWARDS

2300 Tons, New York, North Beach airport, to Carnegie-Illinois Steel Corp., Pittsburgh.

1400 Tons, Detroit, Zug Island coal storage dock, to Dravo Construction Co., Pittsburgh.

NEW PROJECTS

800 Tons, Fairport Harbor, Ohio; bids to be taken June 9 by United States Engineers.

150 Tons, Morgan County, Ohio, sheet piling and 50 tons of bearing piles, project No. 21; bids June 3 by Ohio Department of Highways.

280 Tons, Cleveland, Cuyahoga River straightening project; bids soon.

THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

. . . Machine tool builders report a falling off in orders, but signs of new buying activity are multiplying . . . Releases on held up projects are coming through and small car activity presages new buying . . . Canadian orders expected.

Builders' May Volume Below That of April

CLEVELAND—So far this month incoming business for producers is slightly under the volume for the comparable April period. This is due to declines in both the domestic and foreign fields. Backlogs of export business are still comfortable, however, and in some cases extend into next fall. Principal interest in the export market centers upon reports that Russia may resume large-scale buying again in the near future. Considerable used machinery for Japan has been purchased in this district recently. Machine tool prices are well maintained.

Sharp Drop in Orders Reported at Cincinnati

CINCINNATI—Machinery business in this area dipped sharply the past week to a new low for the year. Domestic ordering is reported very slow, while foreign demand holds to recent levels. All types of tools have felt the reaction with the possible exception of planers. Some manufacturers are increasing attention to stimulation of foreign demand because no immediate rush of domestic business is expected. Inquiry is still reasonably brisk, but consumers hesitate to close on receipt of quotations. Retooling interest, though, is still manifest, but general business conditions force conservative purchasing.

Plants are running about 25 per cent of capacity. Believing that the potential demand is likely to become an early actuality, builders are spreading employment to keep skilled forces intact.

Sellers in Middle West Are Marking Time

CHICAGO—Sellers here are marking time, expecting little additional business over the summer months, but looking for an upturn in the fall, which some believe may be of such volume as to bring the earnings for the year up to a respectable level. Inquiries and orders are few, but the status of most companies is unchanged because of the good business enjoyed in 1937. A replacement program is getting under way at the arsenal at Rock Island, Ill., which will involve the purchase of some horizontal boring mills, radials, lathes and other equipment.

Detroit Sales Perk Up; Small Car Plans Proceeding

DETROIT—With drawings for Auto Show space to be made soon final preparations to get necessary equipment lined up for the new models are indicated. The local tool and die industry, its labor fears shelved now that new union contracts are approved, is going ahead at a steady pace. A State report declares that employment in this field improved 27 per cent in April over March, an indication of the increased activity. At Norge, buying has been going on apace, one machinery specialist reporting that he had "made a month's quota" through a Norge purchase order. Briggs reported last week that its new auto body molding and parts plant would be ready for operation shortly, but would not start until some time in August. Since some releases were believed to have been held up for this plant, they should be made now. Ford, reported to have held up presses for the new Rouge body plant, now is making releases, though at a slower rate. Great secrecy surrounds a number of light car projects sponsored by newcomers in the automotive field, but three are rather definitely ready to go ahead. It appears that negotiations for equipment, plants, etc., are being conducted by agents who have not linked themselves publicly with the principals.

General Industry Showing A Little More Interest

NEW YORK—Although the chief prospects for future business lie with the arsenals, the Naval factories and yards, and the aircraft companies, there has been more buying here and there on the part of general industry in the last week. It has led some to believe that some of the uncertainties had been removed, since several firms of national importance were among them. Part of Westinghouse's $12,000,000 rehabilitation program will involve several of its New Jersey plants. Several leading factors in the East are still out of the market, however, apparently as a matter of policy. While buying on the part of the arsenals has practically ceased, it is expected that new and larger appropriations will be forthcoming, beginning the fiscal year on July 1. It is understood that the Brooklyn Navy Yard, heretofore not a factor in the machinery market, is preparing a sizable list on which quotations will be asked.

Good Market for Machinery Seen in Canada

TORONTO—The Canadian Government is assisting in the purchase of new equipment for companies participating in the recent orders for machine guns placed by the British mission that visited North America a few weeks ago. This equipment will cost around $3,000,000. There are now enough plants in Canada to fill the orders closed or in prospect and no word has been forthcoming regarding additional plants. Undoubtedly, some of this equipment will be purchased from machine tool builders in the United States.

Otis Steel Co. Recognizes SWOC

CLEVELAND.—The Otis Steel Co., in a "memorandum agreement" submitted through a U. S. conciliator, has recognized the Steel Workers Organizing Committee as collective bargaining agency for employees who are members of the union.

Following conferences, J. E. Montgomery, Otis vice-president and general manager, submitted to James F. Dewey, Department of Labor conciliator, a written outline of the company's policy toward the CIO union. Dewey obtained the ratification of SWOC officials May 20.

The agreement covers the continuance of present wage scales and vacations, preservation of seniority rights and other working conditions. Concerning seniority rights, it is provided that in slack periods an equal distribution of work shall be made in the respective departments as nearly as possible, provided the employee is capable of performing the work. It is agreed the company will furnish lists of vacancies in each department and permit applicants chosen according to seniority to have a seven-day trial period for promotion. If unable to qualify, the employee may return to his former position. Leaves of absence without prejudice to seniority standing will be permitted with the consent of superiors. Seniority rights will be preserved through illness of employees or if they are forced to remain away from work because of accident. Employees who have been laid off shall be reemployed before any new men are hired, provided, however, that such a former employee shall report for work within three days after being notified by the company to return to work.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Sperry Products, Inc., and Sperry Rail Service Corp., Manhattan Bridge Plaza, Brooklyn, affiliated organizations, manufacturers of railway devices and equipment, gyroscope track-measuring appliances, etc., have leased a two-story building at Park and Willow Avenues, Hoboken, N. J., about 30,000 sq. ft. of floor space, for new plant. Present works will be removed to new location and capacity increased.

Bureau of Yards and Docks, Navy Department, Washington, will ask bids soon for extension of main wharf at naval ammunition depot, Iona Island, N. Y., including mechanical-handling facilities. Appropriation of $60,000 has been authorized.

General Foods Corp., 250 Park Avenue, New York, is arranging fund of about $7,000,000 for expansion and improvements in plants in different parts of country, including several new units, and will secure appropriation through sale of preferred stock to total close to $15,000,000. Work will include a new multi-story plant at Hoboken, N. J., for processing, packing, storage and distribution, for which general contract recently was let to H. K. Ferguson Co., Cleveland. Company will combine several existing plants at this location, including a factory in Brooklyn, and will expend close to $2,750,000 for building and equipment; on neighboring site, a new technical and research laboratory will be built to cost about $250,000 with equipment. Another contract has been let to H. K. Ferguson Co. for new corn mill at Kankakee, Ill., to cost about $1,500,000 with machinery. About $1,750,000 will be expended for production of quick-freezing machines and accessories, and for purchase of additional refrigerating cabinets and equipment. Other plant expansion is also scheduled to be carried out this year.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 31 for one electric arc welding set (Schedule 3551), line-type terminal heaters and boosters (Schedule 3579) for Brooklyn Navy Yard; until June 7, 13,000 aluminum alloy cartridge case supports (Schedule 3568) for Naval Ammunition Depot, Iona Island, N. Y.

Quartermaster, West Point, N. Y., asks bids until June 1 for brass pipe, galvanized pipe, pipe fittings, angle valves, unions, ferrules, lead pipe, water heater parts, sump pumps and other equipment (Circular 1052-136); until June 3 for four cast iron sectional hot water boilers, magazine feed type.

Mack-International Motor Truck Corp., Thirty-fourth Street and Forty-eighth Avenue, Long Island City, has asked bids on general contract for one-story factory branch, storage and distributing plant at Houston, Tex., 120 x 127 ft. Cost over $75,000 with equipment. Hamilton W. Wills, Dallas, Tex., is company representative in charge.

Contracting Officer, Office of Chief of Engineers, Munitions Building, Washington, asks bids until June 7 for one 35-ton gasoline drive locomotive, or diesel locomotive for Raritan Arsenal, N. J. (Circular 40).

Standard Refining Co., 217 West Street, New York, manufacturer of refined liquid food products, has acquired one and two-story building, 75 x 100 ft., at Palisade Avenue and Bowers Street, Jersey City, N. J., and will improve for new blending and refining plant. Present works will be removed to new location.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until May 31 for taps and four milling cutters (Circular 953), 17,000 small brass forgings for packing stop (Circular 952); until June 1, one sedimentation tank (Circular 960).

General State Authority, 600 North Second Street, Harrisburg, Pa., A. S. Janeway, executive director, will take bids soon on revised plans for new State industrial school at White Hill, Pa. Fund of $2,142,000 has been arranged for project. C. J. Lappley and H. Hornbostel, Riverview Manor, Harrisburg, are architects.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until May 31 for one single-spindle, 5/8-in. motor-driven automatic screw machine (Circular 1029); until June 1, 8000 zinc-base diecastings for closing plugs (Circular 1033).

BUFFALO DISTRICT

National Gypsum Co., 190 Delaware Avenue, Buffalo, is selecting site in South, with deep-water and railroad facilities on Atlantic seaboard, for new mill comprising several units, with power house, machine shop and auxiliary departments. Cost about $900,000 with machinery. Company has arranged for bond issue of $3,500,000 for financing project.

J. G. Pieri Co., 100 Niagara Frontier Food Terminal, Buffalo, wholesale grocer, has let general contract to Joseph J. Luraschi, Stock Exchange Building, for one-story bulk storage and distributing plant. Cost about $45,000 with equipment. Bley & Lyman, 505 Delaware Avenue, are architects; Thomas H. McKaig, last noted address, is engineer.

SOUTH ATLANTIC

Bureau of Yards and Docks, Navy Department, Washington, will prepare plans soon for extensions and improvements in power plant at Naval Air Station, Pensacola, Fla., for which an appropriation of $150,000 has been authorized, including equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 31 for three pot-type gas-fired furnaces (Schedule 3530), one aircraft propeller blade balancing scale, with adjustable counterweights and adaptors for blades with Nos. 1, 1½ and 2 shanks (Schedule 3531) for Naval Air Station, Pensacola, Fla.

WASHINGTON DIST.

Division of Purchases and Sales, Department of Commerce, Washington, asks bids until June 2 for 14 25-kva. diesel engine-generator plants, with equipment; 28 12.5 kva. diesel engine-generator plants, with equipment; 42 outdoor radiators (Proposal 29222).

Chief of Ordnance, U. S. Army, Washington, asks bids until June 6 for one 13-in. and one 9-in. screw-cutting lathes (Proposal 12).

Washington Wholesale Liquor Corp., 1119 Twenty-first Street, N.W., Washington, has let general contract to Victor R. Beauchamp, Inc., 640 K Street, N.W., for one-story storage and distributing plant at 1460 Okie Street, N.E. Cost close to $50,000 with equipment. Fred V. Murphy, 1413 H Street, N.W., is architect.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until June 1 for parts for locomotives and air brake equipment (Circular 398-162); until June 2, three electric reamer drivers, one grinder for connecting rods, three aligners, four electric piston heaters, 11 valve refacers, eight engine truck stands, one cylinder boring machine and two electric grinders (Circular 398-153); until June 3, six electric grinders, two electric brake drum lathes and 14 brake shoe reliners (Circular 398-156).

General Purchasing Officer, Panama Canal, Washington, asks bids until May 31 for brass machine screw nuts, steel pan-head rivets, tinners' rivets, iron or steel plate washers, steel lag screws, brass machine screws, steel welding rods, steel machine bolts, steel nuts, brass bolts, power and lighting cable, and other equipment (Schedule 3354).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 31 for ship and machinists' scrapers (Schedule 3510), steel sockets for Morse taper shank tools (Schedule 3534), shackles, anchor and thimbles, wire rope (Schedule 3519), brass and copper pipe and tubing (Schedule 3517), nippers and pliers (Schedule 3540), countersinks and reamers (Schedule 3539) for Eastern and Western navy yards.

NEW ENGLAND

Bureau of Yards and Docks, Navy Department, Washington, will complete plans soon for one-story addition to structural shop at Boston Navy Yard, for which an appropriation of $731,500 has been authorized, including shop accessories and changing of tools and equipment. Bids are being asked until June 8 for air compressor for yard at New London, Conn. (Specifications 8679).

Harrison Abrasive Corp., Manchester, N. H., recently organized by Nathan C. Harrison and associates, has purchased part of former local textile mill of Amoskeag Mfg. Co., consisting of a one-story building and three-story structure adjoining, about 64,000 sq. ft. of floor space in all. New company will specialize in production of chilled steel shot, diamond steel grit and kindred abrasive products, and will remodel property at once. Mr. Harrison will be president of company.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until June 3 for one wood-turning variety lathe (Circular 237); until June 10, one hydraulic surface grinder, with special attachments (Circular 241), one motor-driven hob, reamer and cutter grinder (Circular 248).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 31 for one sand mixer and muller (Schedule 3571), one horizontal rope machine, 12-thread, three-strand (Schedule 3573) for Boston Navy Yard.

SOUTH CENTRAL

Chattanooga Electric Power Board, Chattanooga, Tenn., asks bids until June 6 for two power substations for new municipal electrical distributing system at Main, Sycamore and Ash Streets, 338 x 343 ft., and on Riverside Drive, 300 x 480 ft., including electrical equipment, feeder cable lines and other equipment. Cost about $100,000. S. R. Finley is chief engineer.

Tube-Turns, Inc., East Broadway, Louisville, manufacturer of seamless drawn fittings, has filed plans for one-story machine shop on South Twenty-eighth Street, for which superstructure will begin at once. Cost over $45,000 with equipment.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until June 6 for two 20-ton gantry cranes, with lifting beams and track bumpers, for hydro-electric generating plants at Guntersville, Ala., and Chickamauga Dam, Tenn.; also for dogging equipment for spillway and intake gates at Chickamauga Dam.

City Council, Fayetteville, Tenn., asks bids until June 17 for new municipal electrical distributing system, with power substation and operating facilities, and transmission line connections with TVA high-tension electric system. Cost about $115,000. Lide & Adler, Woodward Building, Birmingham, are consulting engineers.

SOUTHWEST

Dean Rubber Mfg. Co., Sixteenth and Iron Streets, North Kansas City, Mo., manufacturer of general rubber goods, has plans for one-story and basement addition, 75 x 115 ft., to double present capacity. Cost over $60,000 with machinery.

Dannon Grain & Milling Co., Eighth and Atchison Streets, St. Joseph, Mo., H. L. Dannon, head, has plans for new grain elevator at Maryville, Mo. Cost over $40,000 with elevating, conveying, screening and other equipment.

Steel Sales Corp., 4067 Park Street, St.

Louis, has asked bids on general contract for one-story storage and distributing plant, 100 x 300 ft., on McRee Avenue. Cost over $85,000 with equipment; an air-conditioning system will be installed, overhead traveling cranes, hoists, etc. H. A. Durr & Co., 123 West Madison Street, Chicago, are consulting engineers. Main offices of company are at 129 South Jefferson Street, Chicago.

Walter Ruska & Co., West University Place, Houston, Tex., manufacturers of scientific instruments, parts, etc., have let general contract to J. M. Selber & Co., Houston Merchants' Exchange Building, for new one-story plant, 40 x 85 ft. Cost about $45,000 with equipment.

Quartermaster Office, Fort Bliss, Tex., asks bids until June 2 for deep-well turbine pumping equipment and accessories, pump house with derrick, pipe line and accessories for water supply from well No. 6 to post pumping station (Circular 151-77).

Amarillo Coca-Cola Co., Amarillo, Tex., has let general contract to W. Frank Little Construction Co., Amarillo, for one-story storage and distributing plant. Cost about $45,000 with equipment. Guy A. Garlander, Amarillo, is architect.

City Council, Pecos, Tex., asks bids until May 30 for motor-driven pumping unit and auxiliary equipment, capacity 55 gal. per min., for municipal pumping station. H. R. F. Helland, First National Bank Building, San Antonio, Tex., is consulting engineer.

OHIO AND INDIANA

City Council, Columbus, Ohio, has plans for extensions and improvements in municipal electric power plant, with installation of new generating machinery and auxiliary equipment. A bond issue of $820,000 is being arranged for project, of which about $300,000 will be secured through Federal aid.

Gypsum Canning Co., Mount Pleasant, Ohio, plans rebuilding part of fruit processing and canning plant recently destroyed by fire. Loss about $75,000 with equipment.

Purchasing and Contracting Officer, Quartermaster Corps, Fort Hayes, Columbus, Ohio, asks bids until May 31 for one wheel aligning, axle and frame-straightening machine, with attachments for heavy-duty work (Circular 85-10); until June 1, one brake drum lathe, with grinder attachment and crane fall (Circular 85-11).

City Council, Painesville, Ohio, will take bids soon for one-story addition, 50 x 80 ft., to municipal light and power plant, including equipment. H. Ralph Hadlow, 700 Prospect Avenue, Cleveland, is consulting engineer.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until May 31 for rivets (Circular 970); until June 1, 35,000 lin. ft. of steel tape armored parkway cable, and for other quantities of similar cable in lots of 1000 to 10,000 ft., also 4000 ft. of rubber-insulated lead-covered cable (Circular 981), bomb rack releasing lever springs, cam bar retaining springs, gun mount bearing assemblies, solenoid coil assemblies, etc. (Circular 996); until June 2, pitot tube bracket assemblies, valve attachment gaskets, engine exhaust collector ring assembly, wing nuts and other equipment (Circular 989); until June 3, trunnion assemblies, bomb rack condenser assemblies, 2900 clevis for control cable, clevis nuts, tow target windlass cam left-end shaft nuts, etc. (Circular 990).

Continental Steel Corp., South Main Street, Kokomo, Ind., has approved plans for two-story addition, 80 x 150 ft. Structural steel award has been let to Indiana Bridge Co., Muncie, Ind. Cost close to $100,000 with equipment.

MICHIGAN DISTRICT

Yellow Truck & Coach Mfg. Co., Pontiac, Mich., motor buses and motor trucks, parts, etc., has plans for one-story addition for expansion in machine shop. Cost close to $50,000 with equipment.

City Council, Hillsdale, Mich., will take bids soon for extensions and improvements in municipal electric power plant. Cost about $190,000 with equipment. Hamilton & Weeber, Grand Rapids, Mich., are consulting engineers.

Supreme Propeller Corp., Mount Clemens, Mich., recently organized with capital of $150,000 to manufacture a new type hollow-steel propeller for airplanes, has taken over a local building for plant and will begin production soon. N. J. Stone is general manager.

Tri-County Electric Co-Operative, Inc., Eaton Rapids, Mich., plans new electric power plant for service for electrical distribution system. Cost about $75,000. Financing has been arranged through Federal aid.

Norge Corp., Division of Borg-Warner Corp., 670 East Woodbridge Street, Detroit, manufacturer of electric refrigerators, electric ranges, etc., has let general contract to Barton-Malow Co., 1900 East Jefferson Avenue, for one-story addition to plant on Kercheval Avenue and improvements in present works. Cost over $75,000 with equipment.

MIDDLE WEST

United States Engineer Office, Rock Island, Ill., asks bids until June 2 for contact rail guards, including supports, bolts, washers, anchors and parts (Circular 300).

Kraft-Phenix Cheese Corp., 400 North Rush Street, Chicago, has acquired one-story building at Sulphur Springs, Tex., formerly held by Texas Public Utilities Co., and will remodel for branch plant. Cost over $65,000 with tanks, conveyors and other mechanical equipment.

Tobin Packing Co., Fort Dodge, Iowa, meat packer, has let general contract to W. A. Klinger Construction Co., Warnock Building, Sioux City, Iowa, for three-story addition. Cost close to $100,000 with equipment.

Bureau of Reclamation, Denver, asks bids until May 31 for two 36-in. motor-operated gate valves, one motor-driven, deep-well type pumping unit; one motor-driven, rotary type vacuum pumping unit with accessories, and one 10-ton traveling crane for Glendive pumping station, Glendive, Mont., division, Buffalo Rapids project (Specifications 1069-D).

Central Nebraska Power and Irrigation District, Third and St. Joseph Streets, Hastings, Neb., asks bids until June 7 for copper or aluminum conductor for three transmission lines; 748,000 lin. ft. for line from Jeffrey Canyon power station to Johnson No. 2 power plant (Group 85); 1,563,000 lin. ft. for line from Johnson No. 2 power plant to Hastings (Group 88), and 1,723,000 ft. for line from Hastings to Lincoln, Neb. (Group 91). George E. Johnson is chief engineer and general manager.

United States Engineer Office, Fort Peck, Mont., asks bids until June 1 for files, welder's goggles, welded coil chain, tiller rope and other equipment (Circular 275).

Board of Education, Independent School District, Burlington, Iowa, has plans for two-story and basement industrial art school, for which bids will be asked soon on general contract. Cost about $50,000, exclusive of equipment. Holabird & Root, 343 North Michigan Avenue, Chicago, are architects. Sterling Lord is chairman of building committee.

PACIFIC COAST

Byron Jackson Co., 2150 East Slauson Avenue, Huntington Park, Cal., manufacturer of pumping machinery and parts, has let general contract to Mosher Steel Co., Houston, Tex., for first unit of new branch plant on Navigation Boulevard, Houston, for production of pumping units, oil well tools and allied equipment. Main building will be one-story, 60 x 350 ft., for parts manufacture and assembling, with two-story office and operating building adjoining, 40 x 85 ft. A heat-treating department will be installed. Cost about $200,000 with equipment. Other units are planned later.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 31 for one main propelling marine diesel engine unit and spare parts (Schedule 3545), one motor-driven vertical band-resaw (Schedule 3549) for Mare Island Navy Yard; 150-hp. diesel marine engine unit and spare parts (Schedule 3541); until June 3, one universal testing machine (Schedule 3574) for Puget Sound yard.

Los Angeles Water and Power Bureau, 207 South Broadway, Los Angeles, will take bids at once on general contract for new three-story electric equipment and repair shop, 120 x 180 ft., at 1530 St. John Street. A traveling crane and other mechanical-handling equipment will be installed. Cost about $350,000 with equipment. D. P. Nicklin is purchasing agent of department.

Bureau of Reclamation, Denver, asks bids until June 2 for three 15,200-lb. gate hoists, and one motor-driven hoist-drive unit for Pomona siphon wasteway, Roza division, Yakima, Wash., project (Specifications 1070-D); until June 2, for ventilating and air-cooling equipment for installation in Boulder power plant, Boulder Canyon project (Specifications 1072-D).

Board of Regents, University of Washington, Seattle, asks bids until June 1 for addition to steam power house, including wing extension to boiler room, 45 x 65 ft., new coal storage unit, 50 x 105 ft., and feed water-treating room, 27 x 50 ft., with conveyor equipment for handling fuel, screen conveyor, bucket elevator and other mechanical equipment. Bebb & Gould, Hoge Building, are architects; Lincoln Bouillon, Fourth Avenue Building, is engineer.

RAILROAD BUYING

United Fruit Co. has placed an order for 10 7500-gal. tank cars with Magor Car Corp.

Boston & Maine has ordered one diesel-electric locomotive from American Locomotive Co.

Portland Terminal Co. has placed an order for one diesel-electric switching locomotive with American Locomotive Co.

Semet-Solvay Co. is asking for bids on 10 70-ton hopper cars.

American Car & Foundry Motors Co. has received the following orders for motor coaches: Five 35-passenger coaches from Virginia Electric & Power Co., Richmond, Va.; three 37-passenger intercity coaches from Vermont Transit Co., Burlington, Vt., and one 35-passenger coach from New York State Railways, Utica, N. Y.

Class I railroads on May 1, this year, had 4867 new freight cars on order, according to reports received by the Association of American Railroads. On the same date in 1937 there were 47,290 on order, and on May 1, 1936 there were 18,467. On April 1, this year, 5825 new freight cars were on order.

New steam locomotives on order on May 1 totaled 61 compared with 345 on May 1, last year, and 52 on the same date two years ago. The railroads had 84 new steam locomotives on order on April 1, this year. New electric and diesel locomotives on order May 1 totaled 10 compared with 34 on May 1, 1937, and 25 on May 1, 1936. The railroads on April 1, this year, had 19 new electric and diesel locomotives on order.

Class I railroads in the first four months of this year installed in service 5302 new freight cars compared with 20,946 in the same period in 1937 and 5916 in the same period in 1936.

The railroads in the first four months of 1938 also put in service 94 new steam locomotives and 49 new electric and diesel locomotives compared with 86 steam and seven electric and disel locomotives installed in the same period last year, and three steam and three electric and diesel locomotives in the same period in 1936.

New freight cars and locomotives leased or otherwise acquired are not included in the above figures.

RAILS AND TRACK SUPPLIES

Cleveland Railway Co. has allocated 500 tons of standard rails to Bethlehem Steel Co. and 450 tons of girder rails to Carnegie-Illinois Steel Corp. Formal award, however, has not been made.

PRODUCTS INDEX

CALCIUM METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

CARBIC
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

CARBIDE
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

CARBIDE—Boron
Norton Co., Worcester, Mass.

CARBURIZING—See Heat Treating

CARS—Railway
Iron & Steel Products, Inc., Chicago.

CARS—Industrial and Mining
Atlas Car & Mfg. Co., The, Cleveland.

CASE HARDENING—See Heat Treating

CASTINGS—Acid or Heat Resisting
Ampco Metal, Inc., Milwaukee, Wis.
Cramp Brass & Iron Foundries Co., Philadelphia.
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.
Hoskins Mfg. Co., Detroit, Mich.
Meehanite Metal Corp., Pittsburgh.
Michiana Products Corp., Michigan City, Ind.
Midvale Co., The, Nicetown, Phila., Pa.

CASTINGS—Alloy Iron
Cramp Brass & Iron Foundries Co., Philadelphia.
Forging & Casting Corp., The, Ferndale, Mich.
Michiana Products Corp., Michigan City, Ind.
Western Foundry Co., Chicago.

CASTINGS—Alloy Steel
Advance Foundry Co., The, Dayton, Ohio.
Hartford (Conn.) Electric Steel Corp.
Mackintosh-Hemphill Co., Pittsburgh.
Michiana Products Corp., Michigan City, Ind.
Midvale Co., The, Nicetown, Phila., Pa.

CASTINGS—Aluminum
Aluminum Co. of America, Pittsburgh.
Fairmount Foundry, Inc., Phila., Pa.

CASTINGS—Brass, Bronze, Copper or Aluminum
Bunting Brass & Bronze Co.-The, Toledo, Ohio.
Cadman, A. W., Mfg. Co., Pittsburgh.
Carbon Malleable Casting Co., Inc., Lancaster, Pa.
Cramp Brass & Iron Foundries Co., Philadelphia.
National Bearing Metals Corp., Pittsburgh.
Phosphor Bronze Smelting Co.,The, Phila.
Snyder, W. P., & Co., Pittsburgh.
Spencer's, I. S., Sons, Inc., Guilford, Ct.

CASTINGS—Corrosion Resisting
Cramp Brass & Iron Foundries Co., Philadelphia.
Meehanite Metal Corp., Pittsburgh.
Michiana Products Corp., Michigan City, Ind.
Midvale Co., The, Nicetown, Phila., Pa.

CASTINGS—Die, Aluminum
Aluminum Co. of America, Pittsburgh.

CASTINGS—Electric Steel
Crucible Steel Castings Co., Lansdowne, Pa.

CASTINGS—Gray Iron
Advance Foundry Co., The, Dayton, Ohio.
American Engineering Co., Philadelphia.
Chambersburg (Pa.) Engineering Co.
Commercial Steel Casting Co., Marion Ohio.
Cramp Brass & Iron Foundries Co., Philadelphia.
Fairmount Foundry, Inc., Phila., Pa.
Laconia (N. H.) Malleable Iron Co., Inc.
Midvale Co., The, Nicetown, Phila., Pa.
Murray Iron Wks. Co., Burlington, Iowa.
National Roll & Fdry. Co., Avonmore, Pa.
North Wales (Pa.) Mach. Co., Inc.
Spencer's, I. S., Sons, Inc., Guilford, Ct.
Western Foundry Co., Chicago.

CASTINGS—High Test & Alloy Iron
Cramp Brass & Iron Foundries Co., Philadelphia.
Meehanite Metal Corp., Pittsburgh.
Western Foundry Co., Chicago.

CASTINGS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

CASTINGS—Malleable
Baltimore (Md.) Malleable Iron & Steel Casting Co.
Carbon Malleable Casting Co., Inc., Lancaster, Pa.
Laconia (N. H.) Malleable Iron Co., Inc.
Lake City Malleable Co., The, 5100 Lakeside Ave., Cleveland.
Malleable Iron Fittings Co., Branford, Ct.
Peoria (Ill.) Malleable Castings Co.

CASTINGS—Meehanite Metal
Meehanite Metal Corp., Pittsburgh.

CASTINGS—Monel & Nickel
Cramp Brass & Iron Foundries Co., Philadelphia.
Superior Bronze Corp., Erie, Pa.

CASTINGS—Semi-Steel
Cramp Brass & Iron Foundries Co., Philadelphia.
Malleable Iron Fittings Co., Branford, Ct.

CASTINGS—Steel
Bethlehem (Pa.) Steel Company.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Commercial Steel Casting Co., Marion, Ohio.
Crucible Steel Castings Co., Lansdowne,Pa.
Hartford (Conn.) Electric Steel Corp.
Mackintosh-Hemphill Co., Pittsburgh.
Malleable Iron Fittings Co., Branford, Ct.
Mesta Mch. Co., Pittsburgh.
Michiana Products Corp., Michigan City, Ind.
Midvale Co., The, Nicetown, Phila., Pa.
Standard Steel Wks. Co., Burnham, Pa.
Strong Steel Foundry Co., Buffalo, N. Y.

CASTINGS—Wear Resisting
Meehanite Metal Corp., Pittsburgh.
Western Foundry Co., Chicago.

CEMENT—Acid-Proof
Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CEMENT—Refractory
Carborundum Co., The, Perth Amboy, N. J.
Johns-Manville Corp., 22 East 40th St., New York City.

CEMENT—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.
United States Rubber Products, Inc., 1790 Broadway, N. Y. C.

CHAINS—Conveyor & Elevator
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Diamond Chain & Mfg. Co., Indianapolis, Ind.

CHAINS—Power Transmission
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Ramsey Chain Co., Inc., Albany, N. Y.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAINS—Roller
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Diamond Chain & Mfg. Co. Indianapolis, Ind.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAINS—Silent
Ramsey Chain Co., Inc., Albany, N. Y.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAIRS—Steel, Office
Harter Corp., Sturgis, Mich.

CHANNELS—See Angles, Beams, Channels and Tees

CHECKS—Metal
Cunningham, M. E., Co., Pittsburgh.
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

CHEMICALS—Industrial
Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CHEMICALS—Rust Proofing
Parker Rust-Proof Co., 2186 Milwaukee Ave., Detroit.
Parkin, William M., Co., Pittsburgh.
Udylite Co., The, Detroit.

CHROMIUM METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

CHROMIUM PLATING—See Plating—Chromium

CHUCKING MACHINES—Multiple Spindle
Baird Mch. Co., The, Bridgeport, Conn.
Goss & DeLeeuw Machine Co., New Britain, Conn.
National Acme Co., The, Cleveland.
Potter & Johnston Machine Co., Pawtucket, R. I.

CHUCKS—Air Operated
Hannifin Mfg. Co., Chicago.

CHUCKS—Drill
Cleveland (Ohio) Twist Drill Co., The.
Cushman Chuck Co., Hartford, Conn.
Morse Twist Drill & Mach. Co., New Bedford, Mass.

CHUCKS—Drill, Quick Change
Apex Machine & Tool Co., The, Dayton, Ohio.

CHUCKS—Electric
Cushman Chuck Co., Hartford, Conn.

CHUCKS—Lathe
Cushman Chuck Co., Hartford, Conn.

CHUCKS—Magnetic
Taft-Peirce Mfg. Co.,The,Woonsocket,R.I.

CHUCKS—Tapping
Apex Machine & Tool Co., The, Dayton, Ohio.

CIRCLES—Phosphor Bronze
Phosphor Bronze Smelting Co.,The, Phila.

JUST BETWEEN US TWO

He Itched Clear Through

THE gentleman, who is tactfully explaining to a sensitive associate why the International Nickel people don't like it when you write Monel with a lower-case "m", is your fireside companion's Chicago editor.

Name: Robert G. Bingham.

Not too many years ago, when he was playing a hot bugle in the Kansas City, Mo., boy scout troop, he contracted the itch to become a journalist. His parents were not alarmed, thinking that within a week at the most it would give way to another itch.

It didn't. It lasted a month, a year, and kept right on. So with a sigh they entered him in the University of Missouri School of Journalism. Even after four years he wasn't cured, and he wasn't with The Iron Age editorial staff long before it was discovered that the itch was no mere surface manifestation, but went clear through.

His ability to place one word after another smoothly earned him the post as your Chicago eyes and ears. Smoothness is, in fact, his distinguishing characteristic. Ten minutes after you've met him you have known each other for years. He is the trade press' best-dressed field editor, being blessed with a frame that would flatter—God forbid—a $12 suit.

He shoots in the low eighties and swings a driver with the well-oiled smoothness of a Sam Snead.

Married: Not yet, but biting the rosin.

Up She Goes—One Billion

TILTING the annual corrosion toll a billion, Carl E. Huessner of Chrysler recently told the ASTM Detroit Section that corrosion now costs four billions—B for Benjamin—a year.

Some day somebody is going to add together all those astronomical estimates of the yearly cost of crime, strikes, illness, etc., and get an aggregate that will make the national debt look like the Southside Democratic Club's deficit that year it rained the day of the annual clambake.

Fervor With Thermostatic Control

AFFECTION is an uncertain emotion—unless, of course, you live in Italy, Germany, Russia or Jersey City, where spontaneous demonstrations of love are carefully scheduled.

The grades range from E, consisting of a three-second smile, with no sound effects, to A—a full-throated, hard-shelled Baptist revival hysteria. As you saw in the newspapers, someone made an embarrassing error in scheduling Hitler's Rome reception. The first day he received Grade D—a sort of ginless Tom Collins, like the applause you give the visiting team to prove your sportsmanship. Of course, it was hastily corrected the following day by stepping it up to C plus, which is where you really begin to show your tonsils.

With that prelude, we can sneak in this unscheduled ovation from E. Bryan, manager of the Harriston Stove Co., Ltd., Harriston, Ontario:

> "Your publication is very interesting, up to the minute and worthwhile."

"Joe, We're Over 0.1579 Lb."

ONE of the automobile companies that contributed consumption figures to that stainless steel survey in the May 5 issue gave us a total that ran into hundreds of thousands of pounds and carried it out to the fourth decimal place, bringing it down to the thousandth of a pound.

A rise of a couple of points in the humidity must raise hell with the inventory balance.

Hold That Line

THAT blonde in the Pettinos booth, opposite ours at the Foundry Show, was something of a precisionist, too, in her way. She showed exactly two-thirds of a kneecap—never more, never less—for hour after hour. It must have been in her contract—and we had our fingernails down to the first knuckle after the fourth day.

—A. H. D.

Famous for quality of threads they produce, long life of chasers and all-round dependability.

Following literature available:
Bulletin on H & G General Purpose Die Heads.
Bulletin on new Insert Chaser Type of Die Head.
Bulletin on H & G Threading Machines.

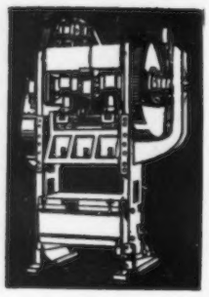
See our Advt., page 281, Jan. 6th Iron Age.

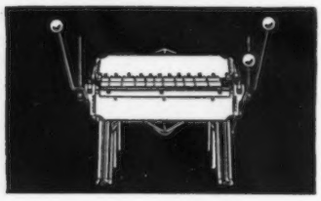
The Eastern Machine Screw Corp.
21-41 Barclay Street, New Haven, Conn.
Los Angeles: A. C. Belgringer, 312 Commercial St., Los Angeles, Cal. San Francisco: Guy Reynolds, 464 Vernon St., Oakland, California.

Die Heads

THE CLEVELAND STEEL TOOL CO.
Punches, Dies, Chisels, Rivet Sets
660 E. 82D St. Cleveland, O.
If it's RIVETED you KNOW it's safe

CHICAGO
BUILT OF STEEL





COMPLETE LINE OF PRESSES, SHEARS AND BRAKES
DREIS & KRUMP MFG. CO.
7430 LOOMIS BLVD. CHICAGO, ILL.

PRESSES
FEEDS
AUTOMATIC EQUIPMENT
THE V & O Press Co.
HUDSON, N. Y.

Special Alloy Steels, High Speed and Carbon Tool and Die Steels, and Stainless Alloys
LATROBE ELECTRIC STEEL COMPANY, LATROBE, PA.

THE MARK "DARWIN" OF QUALITY
PIONEERS OF MODERN QUANTITY PRODUCTION
ALLOY - TOOL - STEELS
DARWIN & MILNER, INC. 1260 W. 4TH ST. CLEVELAND, O.

WETHERELL BROS. STEEL ESTABLISHED 1870
WETHERELL BROS. CO.
251 Albany St., Cambridge, Mass.
C. R. Strip — Stainless Steel
Tool Steel — O H Specialties

PRODUCTS INDEX

CLAY GUNS
Bailey, Wm. M., Co., Pittsburgh.

CLEANERS—Metal
American Chemical Paint Co., Ambler, Pa.
Detroit Rex Products Co., Detroit, Mich.
Ford, J. B., Co., The, Wyandotte, Mich.
Pennsylvania Salt Mfg. Co., Phila., Pa.

CLEANING COMPOUNDS—Alkali
Detroit Rex Products Co., Detroit, Mich.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CLEANING EQUIPMENT—Metal
Detroit Rex Products Co., Detroit, Mich.

CLEANING EQUIPMENT (Metal)—Electro-Chemical
Bullard Co., The, Bridgeport, Conn.

CLUTCH-BRAKES—Magnetic
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

CLUTCHES
Automatic Safety Clutch Co., Inc., Chicago.
Fairbanks, Morse & Co., Chicago.
Falls Clutch & Mchry. Co., The, Cuyahoga Falls, Ohio.
Medart Co., The, St. Louis, Mo.

CLUTCHES—Magnetic
Cutler-Hammer, Inc., Milwaukee.
Dings Magnetic Separator Co., Milwaukee.
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

CLUTCHES—Safety
Automatic Safety Clutch Co., Inc., Chicago.

COAL
Appalachian Coals, Inc., Cincinnati, Ohio.
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Hanna Furnace Corp., The, Detroit, Mich.
Koppers Coal Co., Inc., The, Pittsburgh.

COAL SYSTEMS—Pulverized
Holbeck Engineering Co., Detroit.

COBALT METAL
Central Trading Corp., 511 Fifth Ave., N. Y. C.

COILS—Lead
National Lead Co., 111 Bdway., N. Y. C.

COILS—Pipe
Harrisburg (Pa.) Steel Corp.

COKE—Metallurgical
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., The, Cleveland.
Koppers Co., Pittsburgh.

COKE OVENS—By-Products
Koppers Co., Pittsburgh.

COKE OVENS—Cross Regenerators
Koppers Co., Pittsburgh.

COKE OVENS—With Recovery of By-Products
Koppers Co., Pittsburgh.

COLLETS—Drill
Apex Machine & Tool Co., The, Dayton Ohio.

COLUMBIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

COMBUSTION CONTROLS
Leeds & Northrup Co., Philadelphia.
Morgan Construction Co., Worcester, Mass.

COMPOUNDS—Drawing
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Standard Oil Co. (Indiana), Chicago.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

COMPRESSED AIR FITTINGS
Schrader's, A., Son, 470 Vanderbilt Ave., Bklyn., N. Y.

COMPRESSORS—Air
Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Fairbanks, Morse & Co., Chicago.
Ingersoll-Rand Co., 11 Broadway, New York City.
Westinghouse Air Brake Co., Industria Div., Pittsburgh.
Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Gas
Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.
Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Rebuilt. (See Clearing House Section)

CONDENSERS—Surface & Jet
Ingersoll-Rand Co., 11 Broadway, N.Y.C.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.

CONDUITS—Flexible Metallic
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

CONTRACTORS' SUPPLIES — Second-Hand. (See Clearing House Section)

CONTROL SYSTEMS—Temperature
Leeds & Northrup Co., Philadelphia.

CONTROLLERS—Crane
Clark Controller Co., The, Cleveland.
Cutler-Hammer, Inc., Milwaukee.

CONTROLLERS—Electric
Clark Controller Co., The, Cleveland.
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, Cleveland.
General Electric Co., Schenectady, N. Y.

CONTROLLERS—Valve, Electrically Operated
Cutler-Hammer, Inc., Milwaukee.
Leeds & Northrup Co., Philadelphia.
Vickers, Inc., 1420 Oakman Blvd., Detroit.

CONVEYING AND ELEVATING MACHINERY
Farquhar, A. B., Co., Ltd., York, Pa.
Logan Co., Inc., Louisville, Ky.

CONVEYOR WORMS
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.

CONVEYORS—Gravity
Logan Co., Inc., Louisville, Ky.

CONVEYORS—Monorail
American Monorail Co., The, Cleveland.
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

CONVEYORS—Portable
Farquhar, A. B., Co., Ltd., York, Pa.

COOLING SYSTEMS—Water
Marley Co., The, Kansas City, Kansas.

COPING MACHINES
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

CORE OIL
Penola, Inc., Pittsburgh.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

CORUNDUM WHEELS — See Grinding Wheels

COTTERS AND KEYS—Spring
Hindley Mfg. Co., Valley Falls, R. I.
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.
Lamson & Sessions Co., The, Cleveland.
Western Wire Prods. Co., St. Louis, Mo.

COUNTERBORES
Cleveland (Ohio) Twist Drill Co., The.
Gairing Tool Co., Detroit.
Morse Twist Drill & Mch. Co., New Bedford, Mass.

COUNTERS—Production
Veeder-Root, Inc., Hartford, Ct.

COUNTING MACHINES
Veeder-Root, Inc., Hartford, Conn.

COUPLINGS—Air Hose
Cleveland (Ohio) Pneumatic Tool Co., The.

COUPLINGS—Flexible
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Lovejoy Flexible Coupling Co., Chicago.
Poole Foundry & Mch. Co., Baltimore, Md.
Ramsey Chain Co., Inc., Albany, N. Y.

COUPLINGS—Pipe
Harrisburg (Pa.) Steel Corp.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

CRANES—Crawling Tractor
American Hoist & Derrick Co., St. Paul, Minn.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Ohio Locomotive Crane Co., The, Bucyrus, Ohio.

CRANES — Electric, Industrial, Truck Mounted
Automatic Transportation Co., 75 West 87th St., Chicago, Ill.
Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.

CRANES—Electric Traveling
Armel, James P., Pittsburgh.
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Conco Engineering Works, Mendota, Ill.
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Euclid Crane & Hoist Co., The, Euclid, O.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.
Maris Brothers, Inc., Philadelphia.
Morgan Engineering Co., The, Alliance, O.
Northern Engineering Works, Detroit, Mich.
Reading (Pa.) Chain & Block Corp.
Robbins & Myers, Inc., Springfield, Ohio.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.
Whiting Corp., Harvey, Ill.

CRANES—Gantry
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Morgan Engineering Co., The, Alliance, O.
Whiting Corp., Harvey, Ill.